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ABSTRACT

This document is the final report of the Model Educational Research Training (MERT) program, a graduate program of the New York University School of Education. MERT trains urban school staff in skills necessary to identify problems, design valid research projects, and apply research results. The long-term objective is the training of small groups of competent research and development personnel to work in urban school districts. The paper describes the training sequence, which consists of four phases: a) introduction to basic research skills, b) development and implementation of proposed student research studies, c) refinement of basic research skills, and d) presentation of trainees' research studies. According to an outside evaluator (whose report is included in the document), the project has a) had positive impact on the school districts involved, b) brought attention to the leadership potential of trainees in their respective districts, c) been compared favorably with more traditional approaches to research training by MERT students, and d) raised the educational aspirations of the trainees. For future research training projects, the report makes recommendations concerning recruiting, scheduling, and academic credit. Students' research studies are included in the report. (HMD)

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Final Report

Project No. RO 2 0596
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A MODEL PILOT PROGRAM FOR TRAINING PERSONNEL TO
DEVELOP SOLUTIONS TO MAJOR EDUCATIONAL PROBLEMS

August 31, 1973

U.S. Department of Health, Education, and Welfare
Office of Education
National Center for Educational Research and Development

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Finally, the Project owes much to Mr. Brian Miller, whose services far exceeded his assigned role as administrative secretary. His foresight in planning and constant reminders of needed attention to details by staff and participants made reasonable order from incipient chaos. Further, his excellent and extensive drafts of memoranda and reports were crucial to the management and documentation of results of the Project.

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TABLE OF CONTENTS

Page

ACKNOWLEDGMENTS	
LIST OF APPENDIXES	
INTRODUCTION	1
Background and Rationale for Training Program	1
Training Objectives	2
DESCRIPTION OF TRAINING ACTIVITIES	4
Recruitment and Selection of Trainees	4
Phase I: Summer Institute	7
Phase II: Problem Design	9
Phase III: Inservice Training	11
Phase IV: Reports of Trainee Research Studies	16
Administrative Arrangements	17
SUMMARIES OF TRAINEE RESEARCH STUDIES	19
Studies of Reading: Experimental Form	20
Studies of Reading: Correlational Form	25
Studies in Mathematics: Experimental Form	28
Studies with Other Criteria: Correlational Form	29
ASSESSMENT OF RESEARCH TRAINING PROGRAM	32
Recommendations for Research Training	35
EVALUATION REPORT ON RESEARCH TRAINING PROGRAM	38
APPENDIXES	44

LIST OF APPENDICES

Appendix I: Descriptive Recruiting Brochures	44
Appendix II: Acceptance of Participation in Training . . .	53
Appendix III: Memorandum of Agreement with School District.	54
Appendix IV: Roster of Trainees	55
Appendix V: Research Training Guide	56
Appendix VI: Research Training Guide	57
Appendix VII: Research Description Summary Form	59
Appendix VIII: Research Process Flow Chart	61
Appendix IX: Outline of Sociological and Organizational Profile	63
Appendix X: Evaluation Form for Videotapes	64
Appendix XI: Selected Student Reports	65

INTRODUCTION

Background and Rationale for Training Program

The proposal for a "Model Pilot Program for Training Personnel to Develop Solutions to Major Educational Problems" was derived from a rationale that emphasized several characteristics currently missing from R & D training programs in education. Most notable among these characteristics were the recruitment of indigenous personnel from urban school districts and a training format based upon trainee identification of real operating educational problems. This type of training format represents a departure from the typical university offering in educational research programs. Such a design is, correspondingly, open to criticism on the basis of conventional criteria for educational research. That is, first year trainees in urban school districts are unlikely to "develop solutions to major educational problems" when such solutions have eluded university teams and R & D centers for some years. The prospect, however, that personnel from urban districts, especially minority group representatives, with a commitment to educational program improvement could be trained within the context of their concerns seemed unique and worthwhile.

Thus, the emphasis in the "model pilot program" reported here is definitely on the "training personnel" aspect. As a consequence of this training emphasis, the "Description of Training Activities" (page 4) and "Summaries of Trainee Research Studies" (page 19) reflect a very basic, and perhaps simplistic, focus on the conceptual and analytical skills of beginning researchers. These activities and studies should be viewed as foundation units in what was conceived as a sequence in building competences of trainees to undertake "development of solutions to major educational

problems in their own urban school districts.

Training Objectives

In terms of the training objectives, then, of the Model Educational Research Training (MERT) Program reported here, one may distinguish between short-term objectives and long-term objectives.

Short term objectives were designated in the approved proposal as constituting a basic training sequence. The primary areas of concentration for these objectives were:

1. Definitional Skills - includes the understanding of how researchable problems are identified, how previous research is reviewed and abstracted, use of ERIC system.
2. Conceptualization Skills - includes the competences to relate educational problems to instructional strategies, organizational arrangements, previous findings, and implications for practice.
3. Design Skills - includes the abilities to plan (e.g., PERT skills) and implement a research strategy. Knowledge necessary for the development or adoption of tactics (instruments, interviews, observations) and modes of data collection must also be manifested.
4. Quantification Skills - includes basic understanding and competence in methods of data analysis and statistical inference.
5. Interpretation Skills - includes the abilities to evaluate results in terms of decision-oriented or conclusion-oriented situations. Skills in the areas of diffusion and dissemination are also implied. Close coordination will be maintained with programs training those who will develop new curricula based on research results.

Long term objectives, although somewhat less explicit in the proposal, were directed toward training small cadres of competent R & D personnel to serve in operational settings of urban school districts. Consequently, the long-range design of a model training program was envisioned as consisting of the following stages:

- (1972-73) 1. Development of R & D basic competences through Summer Institute and academic year program focussed on individual research problems.
- (1973) 2. Summer Institute with "advanced" trainees and newly recruited trainees from same districts. Emphasis on developing research team competence.
- (1973-74) 3. Identification of major (district wide) educational problem with cooperation of board and administrative staff. District support and collaboration in prosecuting research studies.

Such a longer range training sequence, or some format approximating this, seems justified on the basis of our single year's experience with the present program. A more detailed rationale supporting such a sequence is offered in the "Assessment of the Research Training Program" (page 32) of this report. This assessment represents the judgment of the project co-directors and includes suggestions and recommendations made by the trainees.

An independent "Evaluation Report" (page 38) was written by Professor Dorothy Strickland, Chairman of the Elementary Education Department of Newark State University. Professor Strickland has received widespread recognition including a national award for her own research work. Her observations and interviews with trainees were arranged to optimize confidentiality and objectivity in assessing the conduct and outcomes of the research training program.

In addition to the summaries of the trainee research studies included in this report, five complete reports of studies are included in Appendix XI.

DESCRIPTION OF TRAINING ACTIVITIES

Recruitment and Selection of Trainees

Recruitment of participants for the one-year training sequence began approximately three months before the start of the Summer Institute. Initial contacts with the thirty-three community school districts in New York City and several school districts in the broader metropolitan area were made by mail and telephone to identify indigenous school personnel for research training. Presentations describing the training program were made by personal visits to schools and in telephone conversations with prospective applicants. Brochures describing the program were sent to district offices and to many individual schools (Appendix 1). These initial recruiting activities were coordinated with the efforts of the NYU-based developer's training program ("One Year Program to Train Developers in Public Education Systems" OEG 0-72-1367).

In mid-June, when more than one hundred applications had been received, staff members from both training programs met to undertake final screening of applicants. A plan was worked out for selecting pairs of trainees, i.e., a trainee in the research program teamed with a trainee in the development program for applicants from the same school district. It was felt that cumulative impact could be made on urban education research and development problems by clustering trainees in several districts. In the final selection process, applicants to the two programs were considered both for their general qualifications and for their suitability for the respective programs. In some cases, an applicant to one program expressed interests that could best be developed in the companion program. By pooling recruitment and selection efforts, the researcher and developer

training programs were able to select the most promising of the qualified applicants for the positions available.

Forty-nine applicants met the general criteria for participation in the research training program. Candidates were expected to meet the following requirements:

1. Possess at least a Bachelor's degree from an accredited college or university.
2. Express a commitment to serve in a research and development capacity in a school district.
3. Provide written approval from appropriate school district officials of arrangements necessary for participation and school system intent to support such a role.

Because of the brief period of time available for selection of applicants prior to the beginning of the training sequence, academic qualifications were determined by the possession of at least a Bachelor's degree and by experience in teaching or educational administration, rather than by a review of transcripts or academic recommendations. In many instances it was possible to get supportive references or recommendations about the applicant's suitability for this type of program from superiors or school district officials. Previous experience or training in the behavioral sciences, statistics, or research methodology was not required for acceptance, although such a background was interpreted as an indication of interest in educational research.

Much of the time available for selection was devoted to insuring that prospective participants could make arrangements with school administration to conduct research studies in their schools and to attend NYU seminars during the 1972-1973 school year. Prospective participants were requested to express their commitment to the goals of the training program

(Appendix II) and to obtain approval from the appropriate school or district official for their participation in the activities contemplated for the training period (Appendix III). Distribution of characteristics of those applicants accepted into the program, including those who declined or withdrew, is shown in Table 1.

TABLE 1

	Applications in Final Screening	Declined or Withdrew	Participants
Male	16	3	8
Female	33	8	12
Black	13	3	9
Puerto Rican	6	5 ^a	1
White	28	2	9
Oriental	2	1	1

^a A ruling issued by the New York City Board of Education affected these applicants' salary and position only if they obtained specialized administration and supervision credits prior to September, 1972.

Sixty percent of the applicants selected for participation were women and fifty-five percent were members of ethnic minority groups. Recruitment was specifically directed to encourage applications from qualified members of these groups, particularly women, whose traditional role stereotypes have tended to exclude them from research positions.

The final roster of twenty trainees represented nine school districts within New York City and two suburban school districts. (A list of the trainees, their school districts, and areas of educational expertise appears in Appendix IV.) Of the nine New York City school districts, six also had a participant in the developer's training program. These districts represented areas manifesting a high incidence of typical and emerging urban education problems. Areas of experience and interest ranged from

early childhood to adult education and included science, social studies, reading, bi-lingual education, drug abuse, mathematics, counseling, and school psychology. The heterogeneity of interest and experience was considered an advantage to the participants, as the group was small enough to permit a great deal of exchange of ideas and attitudes, and thus provided a broader view of the domain of educational research.

Phase I: Summer Institute

Training began on July 3, 1972 with a six-week Summer Institute designed to introduce participants to basic research skills. The institute was organized into sequences of experiences that were intended to allay apprehensions about the occult nature of research and statistical processes. The first week of training was devoted to a workshop approach to the development of problem solving and communication skills. The small group interaction processes employed were based on a modification of the "Research Utilizing Problem Solving" (RUPS) materials developed by the Northwest Regional Laboratory. A common hypothetical problem in education served to make participants conversant with a general research sequence. Groups identified a problem, conceptualized a rationale for data gathering, synthesized research and literature related to the problem, designed or selected appropriate instruments, received and interpreted simulated data, and drew conclusions and implications for practice (see Appendixes V and VI for examples). Discussion and critical feedback from the training groups and instructional staff provided initial grasp and insight into the problems and processes of researching educational problems. These experiences evoked the group dynamics basic to the acquisition of certain interpersonal skills and group relationships necessary for institute activities and were designed to promote an atmosphere of cooperation rather than competition among the participants.

These initial sessions were followed by a more intense consideration of basic research skills. Definitional skills were developed by demonstrating how researchable problems are identified and how previous research is reviewed and abstracted. Evaluation studies of compensatory education programs in the trainees' school districts were used to identify problem areas. The Educational Information Consultant model of the Far West Regional Laboratory was adapted to develop skills of locating and using available educational information. The E.R.I.C. retrieval system was employed to summarize research in problem areas of interest to trainees. One session was spent at the "E.R.I.C.-Dialog" facility of Lockheed Corporation to conduct an extensive search of literature relevant to problem areas identified as potential research interests of the trainees.

After three weeks of daily sessions, when trainees had acquired sufficient definitional and conceptualization skills to identify researchable problems of their own interest, the focus of the Summer Institute shifted to the development of instrumentation and data analysis skills. At this time, daily sessions were divided into formal presentations of the principles of measurement and criteria for selection of appropriate instruments, and into small-group discussions with staff members on the research proposals which had emerged from the initial sessions. Trainees were given an overview of research design and the utility of the hypothesis-testing model of research. Instruction and discussion were designed to refine and clarify problem statements and research designs and to select existing instruments or to develop new instrumentation for individual research studies. Formal instruction in analytic techniques provided experience in using compilations of tests and scales and trainees used a

technique-oriented, programmed instruction series in elementary descriptive statistics to supplement classroom presentations.

During this period of the Summer Institute trainees were also oriented to the use of computer facilities and were afforded opportunities to work through pre-programmed statistical analysis packages to gain experience in computational and analytical skills. After the conclusion of the six-week Summer Institute two groups of trainees visited the Educational Testing Service facility in Princeton, New Jersey to observe and discuss basic techniques in test development and standardization.

The activities of the entire Summer Institute phase of training were designed to accomplish the following:

- identify the twenty trainees as members of a cooperative researcher group
- bring knowledge of current educational problems from the school environments of individual trainees
- relate educational problems identified by trainees to the systematic nature of research for solutions to those problems
- provide instruction and experiences to form a foundation upon which trainees could formulate and carry out a research study of their design

At the conclusion of the Summer Institute trainees had sufficient familiarity with the fundamentals of educational research and access to resource materials and personnel to construct research designs for studies which could be carried out during the 1972-1973 school year.

Phase II: Problem Design

Trainees devoted the three weeks following the conclusion of the Summer Institute to the development and implementation of proposed research studies in their schools and school districts. Trainees searched literature

relevant to their problem areas, sought specific approval and support for research designs, instrumentation, and strategies for implementation. Of the seventeen studies underway at this time, some had reached the direct implementation stage. In these cases, trainees were obtaining instruments, establishing testing dates, and making arrangements with appropriate school, district, and central administration personnel for access to school records and to the pupil, teacher, and community populations involved in the proposed studies. Individual conferences with NYU staff were devoted to facilitation of these arrangements, direction to appropriate school personnel, and assistance in obtaining district approval.

In other cases, trainees were seeking general approval for proposed studies. Meetings with school, district, and central administration sometimes led to revisions of the original research design. For example, an instrument selected by a trainee in consultation with NYU staff might be replaced by a comparable instrument that was to be administered in connection with a school or district testing program. In such a case, arrangements were made to make test results available to the trainees for their proposed research study. Trainees whose studies had not evolved to the direct implementation stage worked with NYU staff and school personnel to plan research of interest and relevance to both the student and the participating schools. NYU staff acted as resources in the planning, development, and implementation of research designs, but research proposals were essentially products of the trainees' own efforts. Students were encouraged to utilize the NYU training staff as consultants rather than as supervisors or monitors of research studies. Similarly, the material resources of the training program were made available for research studies as well as for training

supplies. For example, the administrative staff of the training program assisted in the acquisition of instruments selected by trainees for use in the proposed research.

During this three week period of individual work on problem design trainees began preparing Research Description Summary forms (see Appendix VII for example) to assist in planning and carrying out their studies. These forms were submitted to the project office from time to time as revisions in the proposed research were made. By recording the contemplated activities and cataloguing the required material needs and supportive services, trainees were able to plan effectively data collection, data analysis, and reporting. Thus trainees maintained managerial control of their studies while constantly apprising the training staff of the status of their progress.

At the conclusion of the Problem Design phase of training, most proposed research studies were underway. The training sequence was planned such that trainees would have completed the initial planning and "legwork" involved in implementing their studies prior to the resumption of their regular employment in September, 1972. Thus, the extensive and time-consuming work involved in obtaining specific approval for research conducted in the schools was largely completed by the end of August.

Phase III: Inservice Training

Following the development and implementation of individual research studies in Phase II, the focus of training shifted to the refinement of the basic research skills initially introduced in the Summer Institute. In addition, close attention was given to problems of data collection, testing and measurement, and research management that emerged from on-going

trainee studies.

Two series of core seminars were established for training students in the program. Participants were scheduled for one seminar each week at a field location and one seminar each week at the Washington Square campus of New York University. Because of travel time involved, the field seminars were arranged at two locations: one for trainees located in Manhattan and the Bronx, and one for trainees located in Brooklyn and Queens. Trainees received credit for their participation in these core seminars consistent with School of Education policies at New York University. Thus, the seminars were conducted under established NYU course designations and numbers. However, since participation in the seminars was limited to members of the training group, the content and format of the seminars were determined in part by the needs and interests of the trainees. Much of the direction of discussion in the seminar meetings was determined by problems and concerns generated by on-going research studies.

To some extent the seminars were organized into series of "mini-courses" on problem areas. Occasionally these special sessions were conducted by invited school, district, or university personnel with expertise in the field of interest. Although all trainees attended the special seminars, some students were permitted to register in established NYU courses not conducted for this training program. This occurred if the student had demonstrated competence in basic research skills and further required specialized course work in some aspect of the research studies underway. For example, a trainee conducting a reading research study who had experience in research design and data analysis might participate in a university course in diagnostic techniques in reading. Nevertheless,

trainees were expected to attend the special seminars even when registration in alternate courses was permitted.

In the Fall term, field seminars emphasized sociological aspects of educational problems and problem-solving models. Individual student research endeavors were discussed and analyzed in their relation to theoretical consideration of school organization. School and community personnel were invited to increase proximity to actual urban education problems, to inform trainees of school and community characteristics, and to provide critical feedback and direction to research activities.

The Fall term of the Washington Square seminar of the Inservice Training phase provided exposure to aspects of learning theory, social psychology, reading, personality, and developmental psychology. Selected readings in these various disciplines and consideration of trainee research studies focussed psychological knowledge on field problems. Preferred strategies in psychological research and techniques of mensuration were elucidated with particular attention to the types of problems instanced by trainee projects. The intensity and duration of concentration on particular topics was determined by students' needs and staff assessment of trainee progress. Substantial emphasis was placed on procedures for maintaining continuous self-monitoring of the progress of the individual research studies through extensive problem description statements, flow charts for planning, and logs of progress. Most trainees employed the Research Description Summary form to record the progress of research studies. After approximately six weeks of inservice training students had established adequate administrative control of their research projects and thus discontinued maintenance of weekly logs of progress and activities.

At the end of January, 1973, each trainee made an oral presentation as well as a written report of research progress to staff and fellow trainees. These reports were evaluated both for their substantive features covering aspects of the research and for formal characteristics of report presentation. The NYU staff constructed master planning charts for monitoring research projects based on information provided periodically by students (see AppendixVIII for format). Trainees used these charts in their presentations to indicate the status of research management of their projects. Presentations were subject to questions and feedback from staff and students, and thus provided an opportunity for trainees to demonstrate competence in an actual performance.

At the time of the January interim reports, most trainee research projects had reached the data collection stage. Some projects had completed data collection and were progressing to preliminary data analysis. Other studies had completed collection of pre-test data and were awaiting collection of post-test data at the conclusion of the school year. However, some projects which had not been fully implemented at the conclusion of the Problem Design phase did not receive approval from all the school officials concerned until as late as February, 1973. Nevertheless, after the January interim reports the weekly seminar classes dealt primarily with problems in data analysis and interpretation, although individual conferences were devoted to the special problems of those studies which had not yet reached the analysis stages.

During the Spring academic term, as trainees reached the data analysis and interpretation stages of their research studies, the focus of the field seminars shifted to community analysis and to the organizational

processes and personnel involved in adopting new programs as a consequence of research findings. At this stage, the formal relationships between educational researchers and developers, and their interactions with dissemination and evaluation personnel were elicited from actual trainee experience with research process. The organizational complexities and corresponding techniques for implementation of program changes were treated in detail.

In addition to formal training and discussion of individual research projects, field seminars also provided instruction in the preparation of sociological and organizational profiles of the schools or areas in which student research inquiries were conducted. These profiles presented data on ethnic distribution, socioeconomic status, and the language of the pupil and community populations, as well as data on the size and composition of the school staff and relevant characteristics of the school organization. These profiles were incorporated into the trainees' final reports of research (see Appendix IX for outline of profile).

In the Spring Term, the New York University-based seminar discussed types of problems, data collection and analysis, and ways of presenting findings. Each class meeting was devoted to a topic of research with a discussion of those aspects of trainee research exemplifying specific topics. In addition, there was a review of basic statistical techniques and a return at an advanced stage to considerations of research and measurement first introduced in the Summer Institute. A faculty member from the Department of Educational Statistics was invited to conduct the intensive sessions in statistical analysis.

Phase IV: Reports of Trainee Research Studies

After the conclusion of the Inservice Training Phase trainees prepared final written and oral presentations of their research studies. Originally, these reports were to be submitted by June 15, 1973. However, because of the dependence of many studies on post-test data from school administered tests and instruments, some trainees were unable to obtain test scores until early June. Therefore, a new deadline of July 6, 1973 was established for student reporting.

This phase of the training sequence was a period of intense individual work in data analysis and interpretation. In completing studies trainees employed skills that had been learned during the entire preceding period of training. Close coordination with the training staff enabled trainees to score test results, prepare coding formats, keypunch data cards, select executive computer programs for data analysis, and interpret computer printouts. The graduate assistant in measurement and data analysis helped students with computer work and analysis.

Before submitting written final reports, trainees made oral presentations of final results for NYU staff and fellow trainees. These oral presentations were videotaped at New York University's Teaching Performance Center and completed videotapes were made available to students for individual review. Staff members evaluated each student performance in these presentations both for substantive aspects of the report and for formal characteristics of report presentation (see Appendix X for sample evaluation form). These videotaping sessions gave students experience in report presentation prior to any reporting they might do for school, district, or community groups on their research endeavors. A tally

of the evaluations of student presentations appears in Table 2.

TABLE 2

SUBSTANTIVE FEATURES OF THE REPORT	Number of Responses			
	Poor	Fair	Good	Excl.
1. Logical organization of material	0	10	9	5
2. Research procedures and findings	3	6	10	4
3. Elucidation of research implications	4	6	10	1
4. Appropriate & adequate visual displays	9	4	7	1
5. Adequate responses to questions	0	3	9	3
FORMAL FEATURES OF THE PRESENTATION				
1. "Heads up" presentation	0	9	9	5
2. Verbal stylistics (phrasing, etc.)	0	6	13	5
3. Style appropriate for laymen	1	5	10	7
4. Contact in eliciting/answering questions	1	5	6	2
5. Reference to visual displays	6	1	6	4
6. Appropriate eye contact	0	5	11	8
7. Appropriate gestures	0	11	10	1
8. General "presence"	0	6	12	6

Administrative Arrangements

Academic Credit. Academic credit accrued to participants consistent with School of Education policies. As participants in this training program, students were not matriculated in graduate degree programs. Therefore, earned credits in training did not automatically apply towards a graduate degree. However, trainees who entered graduate degree programs in various departments in the School of Education were generally able to apply credits earned in training to the degree program they entered. The entire training sequence consisted of 20 points of credit. Tuition and fees were provided by the training program for the 20 point sequence; students who entered degree programs occasionally registered for additional courses for which they paid tuition and fees themselves. The schedule of

course credits and the departments in which credit was received is as follows:

Phase I: Summer Institute

3 points of credit; Interdisciplinary (Research)
3 points of credit; Educational Psychology

Phase II: Problem Design

1 point of credit; Educational Psychology

Phase III: Inservice Training

3 points of credit; Educational Administration	Fall, 1972
3 points of credit; Educational Psychology	Fall, 1972
3 points of credit; Educational Administration	Spring, 1973
3 points of credit; Interdisciplinary (Research)	Spring, 1973

Phase IV: Reports of Trainee Research Studies

1 point of credit; Educational Administration

Trainee Stipends. During the period of the six-week Summer Institute trainees received a weekly stipend of \$75 to defray living expenses. During the period of the Inservice Training phase, trainees were allowed \$10/week for transportation expenses incurred in attending seminar classes and in conducting research studies. Arrangements were made to expend these funds for the purchase of supplies and services for research studies as well as for travel. As students' transportation and research supports needs differed, this allocation policy made reimbursement for student expenditures as equitable as possible.

SUMMARIES OF TRAINEE RESEARCH STUDIES

Of the twenty trainees who began the training program in the summer of 1972, one withdrew because of injuries prior to the beginning of the Fall term, and one withdrew at the end of the Fall term because of a major change in his employment situation. Two participants who had attended sporadically during the Fall term lost interest entirely during the Spring term and did not carry out their projects; two others who did carry out their projects had not reported them in writing as of August 20, 1973, and are thus not included in this summary. One of the reports is a joint effort of two participants; there are, then, thirteen reports in all to be discussed.

It is interesting, as an overview, that nine of the thirteen reports used reading improvement as a criterion; two used mathematics improvement and one used biology achievement as criteria. Eight of the studies were experimental in form, seven involving a manipulated treatment and one an ex post facto categorization. The remaining five studies were correlational in form, seeking relations more than effects. The overall difficulties encountered, and the paucity of clearcut findings, especially in the manipulated treatment, experimental studies, suggests that this form might not be the most conducive to gaining the information so sorely needed for educational research. At the time the problems were formulated, however, only a few of the participants had the necessary competence and confidence to undertake multivariate correlational analyses, appropriate as they are to most significant educational problems.

Studies of Reading: Experimental Form

There are six studies in this category. Each involved somewhat different independent variables.

1. The study involving the greatest number of students arose from an interest in the participants' Department of Language Arts in undertaking more individualized instruction at the junior high school level. A 251-item test was developed by members of that department with the intention of providing diagnostic information; 14 subscales were developed, including sentence recognition, subject recognition, comma usage, pronouns, and other familiar components of written language. In general, the subscales appeared to be reasonably reliable, based on internal consistency estimates, considering that most were quite short; further work is anticipated to improve the reliabilities where they are weak. Intercorrelations among the subscales vary, but a number are rather low, suggesting that knowledge about relatively independent components of written language is being assessed. Overall, 1,025 junior high school students completed the diagnostic test. In addition, the results of a school-wide standardized reading examination (California Achievement Test--- Level 4), the first quarter Language Arts grade, and the results of a Mathematics Fundamentals Test were collected for each subject.

As a second matter of interest, especially with regard to incoming students, analyses of variance were performed using elementary school as the ex post facto categorization. Although the F-ratio was significant for some variables, including sentence recognition, predicate recognition, verb tense, possessive nouns, antecedents, and total, the corresponding values of omega-squared are quite small. Thus, no clear indication for classification on the basis of elementary school resulted from this study. As a general response,

teachers believe that the information provided them, such as grade and class profiles, as well as individual score vectors, will be very helpful as they increase their emphasis on individualized instruction in language arts.

(This study is presented in full in Appendix XI, page 66.)

2. Another relatively large-scale study employed bilingual (English-Spanish) vs. monolingual as an assigned variable (in an ex post facto sense), and bilingual instruction for the bilingual students as the treatment. Several criteria were thus available: progress in native language, progress in understanding concepts, and progress in visual discrimination. Subjects were pre and posttested with the following instruments: the Boehm Test of Basic Concepts in either Spanish or English; the New York City Prereading Assessment-Language in either Spanish or English; the New York City Prereading Assessment-Visual Discrimination in either Spanish or English, the Linguistic Capacity Index for Spanish speaking children and the Test of Basic Experience-Language for English speaking children. The initial design had called for a group of monolingual, Spanish dominant children, but the number of such children was too small to consider in the study. The criteria are no doubt correlated, but the vagaries of the design as it was eventually implemented precluded a more elaborate analysis, such as a multivariate analysis of variance. Among the more striking results were that growth in concept knowledge was parallel for the monolingual English children (instructed in English) and the bilingual Spanish dominant children (instructed in both languages, post-tested in English), although the former had higher scores, but that the growth for bilingual English dominant children was substantially less than for the bilingual Spanish dominant children, although again the final scores for English dominant children were higher. One

implication is supported in part by the report that the English instruction program was highly structured while the Spanish instruction program was not, and that most teachers preferred the former. It is that the Spanish input in the bilingual instruction program facilitated the Spanish dominant but inhibited (through interference, perhaps) the English dominant children's learning of concepts. This possibility should be considered seriously, especially since concept learning is so highly verbalized in most school settings. There were no differences in the three groups of children in progress in native language or visual discrimination. The groups were of size 87 for each of the two bilingual groups, and 85 for the monolingual group. (This study is presented in full in Appendix XI, page 92.)

3. Another well-designed study involved manipulating the amount of oral reading to first grade students at three levels of rated capability for school work (tracked). The top level included children who had kindergarten experience and were rated high on verbalization and "reasoning"; the second level children had kindergarten, but were rated less apt on the two criteria; the third level children had no kindergarten experience and were rated low on the criteria. It is likely, although not ascertainable in this study, that some children in the lower group were "able," but lacked the acculturation which would have made their ability more visible. The school population is 60% Puerto Rican and 40% Black; non-English speaking children were not included in the study, although they were allowed to remain as members of their classes. The sampling unit, strictly speaking, is the intact class, although the analysis is at the level of individual children. All teachers were white, with substantial experience at grade level. The amount of oral reading specified varied: none, once weekly,

and daily. Growth was measured by a newly-devised test of picture-word identification. The pretest was oral, and the posttest required reading the word and selecting the appropriate picture. There is some indication that the posttest proved too easy for the top level children, especially those in the daily oral reading class. The data were analyzed in a 3 X 3 analysis of covariance with 21 children in each of the 9 cells. The predominant differences, both in growth and final level, were attributable to differences in level of rated ability. This, of course, is not surprising. It was a gratifying result that oral reading contributed both to growth and to final level, although the differences between weekly and daily oral reading by the teacher were not statistically supportable. There was a statistically significant interaction, reflecting the greatest responsiveness to the joint effects of level and "being read to" apparently in the second level children, but perhaps this was a function of the ceiling effect for the top level children suggested above. Perusal of the means suggests, though this possibility was not tested, that the overall effect of coming to school is greatest for the third level children, regardless of the treatment. This apparent effect may reflect the acculturation which, for the other groups, occurred in kindergarten. (This study is presented in full in Appendix XI, page 120.)

4. To gain some information on the possible effects of providing teachers with diagnostic information, a study involving six teachers and their classes was mounted. The manipulation here was providing diagnostic reading information from a standardized test (Stanford Diagnostic Reading Test) regarding the teachers' pupils for three of the six teachers, but not for the others. Teachers given the diagnostic information were also

given several discussion sessions in its proper use. All teachers were tested with the Burnett Scale for measuring the diagnostic proficiency of teachers for knowledge of techniques for teaching reading before the experiment, and were observed weekly during the experiment. Although teachers who knew more about techniques of teaching reading, and who had diagnostic information about their pupils, used small-group instruction more often, there was no discernible effect on the improvement of the pupils in reading. One might infer the lack of a linkage from teacher knowledge to its application to the individual child's difficulties. The 117 children involved in this study were Black or Puerto Rican, although all were judged English-speaking at a level adequate for the purposes of this study. They were drawn from grades 3, 4, and 5. The participant-researcher concludes that grouping is not enough, and that the intent to individualize instruction is not enough; a reading specialist in the school district is a minimum additional staffing to provide the linkage to practice.

5. This study of individualized training in English as a Second Language in a vocational setting sponsored by the Manpower Development program began with great expectations, but foundered when funds for materials necessary for the individualized program were denied to the agency. The study was eroded further by attrition due to illness, pregnancy, loss of interest, and other influences which reduced the initial group of 50 women to 30 who finally completed the limited training program. Progress in basic education skills was measured by pre and posttesting with the California Achievement Test, student vocational interest was determined by the Personal Interest Inventory, and typing ability was determined by weekly averages of timed typing drills. Progress in basic education skills was

greater, but not significantly so, for students in the English as a Second Language program than for those not needing that program (about 50% of the trainees are of Latin origin). No significant differences were found in typing speed between the two groups.

6. Using a set of quite small samples from five grades in a disadvantaged area (total N=49), the effectiveness of a paraprofessional assigned to augment classroom teachers' instruction, emphasizing English as a Second Language, was investigated. It is reported that the rate of retardation appeared to decrease, and that some children made gains during the year of more than a year on grade-placement norms. The small sample, and absence of complete data on variability within the groups, preclude making definitive inferences regarding either the effectiveness of ESL or of the paraprofessional involvement.

Studies of Reading: Correlational Form

Two of the three studies in this category involve rather small samples, but the third sample is quite large. All seek relations among variables rather than effectiveness of treatments, although one study (No. 9) might elsewhere have been approached as an ex post facto experimental design, with consequent loss of all-too-scarce information.

7. Questioning whether (1) teacher attitude toward individualized instruction and (2) level of teacher preparation in techniques of reading contributed to pupil progress in reading, this study used six teachers from fourth and fifth grade classes totalling some 150 children. To measure attitude, new items were prepared with a focus on individualized instruction and inserted in an existing scale of attitude toward education. Amount of teacher preparation was obtained by a self-report on a questionnaire. The

results showed no relation between pupil growth in reading (as measured by the Metropolitan Achievement Test) and either teacher attitude toward education or attitude toward individualized instruction. There was a small significant correlation between amount of preparation in teaching reading and pupil growth in reading. As suggested in Study 4, above, intent to individualize instruction is not enough.

8. Another study sought relations to reading growth (measured by the Metropolitan Achievement Test), in retarded readers, of specific aptitudes hypothesized to measure visual (spatial) aspects of symbolic coding, verbal and figural classification, figural divergent thinking, and some possible aspects of field dependence. These aptitudes were measured by selected tests from the Guilford structure-of-intellect model. Through attrition, the study ended up much smaller in scope than was initially envisioned. Due in part to a change in the job level of the participant, the study underwent its first reduction from several classes to one. Subsequent absenteeism and lack of data reduced the final usable sample to 18 boys in sixth grade, all reading below grade level. Due to the participant's other new responsibilities, no substantial use could be made of the information from the specific tests in instruction. Based on the sample of 18, statistically significant correlations were obtained between the measure of reading performance and several of the measures of specific aptitudes, but gain in performance was not related to any of the specific aptitude measures. It is suggestive, for further work, that significant correlations of MAT reading with divergent thinking, verbal classification, and two measures of symbolic manipulation were obtained. Correlations of these measures with verbal comprehension per se were low.

9. The interest in individualized instruction is easily extended to include the non-aptitude aspects of the individual. This study began with an expected sample size of 180 or more, based on six classrooms in fourth and fifth grade of a suburban school. Due to absence on days of testing and other missing data, the effective sample size is 157. The relations sought, based on this sample, were between the 14 personality dimensions measured by Cattell's Children's Personality Questionnaire and reading performance on the Metropolitan Achievement Test. Somewhat disappointingly, but consistent with common sense, the major finding was that the child having more of the personality traits of stand-offish caution and emotional stability was more likely to show improvement in reading under individual instruction. The multiple-R, however, was only .22, although statistically significant.

As an additional interest, measures from the Stanford Diagnostic Reading Test were also included in the analysis. The SDRT measure of vocabulary was positively related to the traits of crystallized intelligence, emotional stability, and apprehension (in the sense of keen awareness, but not anxiety), and the score for blends was related to stability. These four correlation coefficients were in the low .20's, statistically significant but hardly large enough to support a strong recommendation for a guidance counselor or teacher. Still, the trends are there, and teachers in individualized instruction might do worse than to be sensitive to a child's lack of acculturation, preference for being a member of a group in contrast to being "on the line alone," and tendency to be too much affected by feelings--his own or those exhibited by the teacher in the individualized situation.

It is of methodological interest that a two-group discriminant analysis, in which the groups were defined by achievement above or below historical

expectation, failed to show the relations which emerged when the same achievement information was used as a continuous criterion, adjusted for previous achievement. Because the two procedures, 2-group discriminant analysis and multiple-R, are identical when the criterion is dichotomous, the lack of findings is attributable to the loss of information as a result of dichotomization.

Studies in Mathematics: Experimental Form

10. The integration of science and mathematics is often alleged to benefit both disciplines. In this small study, sections of the COPES (Conceptually Oriented Program for Elementary Science) materials emphasizing measurement at grades 3 and 4 were used in lieu of regular mathematics instructional materials for the topics of probability, statistics, measurement, and graphs, which are included in the New York City Board of Education 4th grade syllabus. COPES was developed at New York University through the interaction of the School of Education and the Department of Physics and emphasizes pupil activity and discovery of conceptual relations. The criterion was the MAT mathematics concepts test, adjusted for performance on that test in 1972. The results, after instruction using the two sets of materials, showed clearly that the group which had used the COPES materials performed significantly better than did their counterparts. The COPES group had a gain of 1.2 years (grade equivalent) in contrast to the 0.7 year gain of the other group. The probability of this occurring by chance, with $N=42$ in the combined groups and an F -ratio of 12.8, is less than 1%. It is reported by the participant researcher that several teachers in the school wish to use the COPES materials next year where possible for mathematics and also for science instruction. (This study is reported in full in Appendix XI, page 163.)

11. Questions frequently arise regarding whether a test involves reading as a facilitating, and thus necessary component. This is particularly of concern where non-reading skills are being assessed. In the present study, a sample size of close to 100 was anticipated; incomplete records and other sources of attrition reduced the effective sample to 33. The design is straightforward, involving a comparison of performance on alternate forms of a mathematics test (Uniform City-Wide Examination, Mathematics 7th Year) administered routinely in silence each year, and experimentally in this study by reading each question aloud. Although the sample is small, the results are significant: seventh grade students did better under the oral administration than they had done under the silent administration of an alternate form. This result suggests that reading skills and/or reading speed may be reflected in scores attributed to non-reading skills obtained by students who are functioning below grade level.

Studies with Other Criteria: Correlational Form

12. From time to time, it is suggested that teacher-pupil complementarity, in the domain of personality, is important for pupil progress in subject matter. This study involved 388 students and 11 teachers in biology classes; all teachers are Caucasian, as are most of the students in this middle class community. A total of more than 700 students were tested, but only 388 had all necessary information. Students took Cattell's High School Personality Questionnaire, while teachers took its adult counterpart, the 16 Personality Factor Inventory. Five of the personality traits common to the two scales were used in determining a comparison index for teacher-student complementarity. The broad factor of exvia vs. invia (called extraversion vs. introversion by some other

investigators) was derived for each person, and the index I-E obtained for each student; this index is his teacher's score on extraversion minus his own. Also, each student completed an attitude scale regarding his attitude toward school in general. Finally, data on biology achievement were obtained for each student. Due to the fact that the biology grades were not available until the end of the school year, other variables in the HSPQ were not explored in this study; the data, however, are available for further exploration. The results are quite clear regarding the effect of teacher-student complementarity on achievement, at least in high school biology: there is none. Girls who have extravertive tendencies do better in biology than do introvertive boys. Also, students with more positive attitudes and extravertive tendencies do better in biology. Of particular interest is another result, in answer to a publicized contention last year by a member of the New York City Board of Education that compatibility could be assessed (and presumably students assigned) by zodiacal sign pairing. Complementarity as defined above, when examined within groups determined by zodiacal sign of student, was not effective as a predictor of achievement. Neither were the achievement means of the 12 sign-determined groups significantly different. So much for the stars. (This study is presented in full in Appendix XI, p. 185.)

13. The relation of affective components of personality to the more "problem-solving" aspects of behavior is always of interest. In this study, a comparison was made between performance on the rod-and-frame task, taken as a measure of field independence and, by extension, individuation of one's self as a person, and performance on two Piagetian tasks: horizontality and conservation of volume. In the rod-and-frame task, a child was asked to align "up and down" a rod which was displayed in a frame

which itself was askew, all other visual external cues being minimized; the child who positions the rod more near the vertical regardless of the position of the frame is said to be field independent. In the horizontality task, the child, who has been shown a bottle partly filled with colored water and displayed in different orientations, is asked to draw where the water line would be when all he is shown is the contour of the bottle, again displayed in different orientations. If he draws a horizontal line regardless of the tilt of the bottle, he is said to "conserve horizontality." In the conservation of volume task, the child is presented with two balls of clay which are adjusted until the child agrees that they are equal, and two identical glasses are filled with water until the child agrees that the level is the same. If, when one ball of clay is rolled into a sausage shape, flattened, or broken into parts, the child is able to say that the water level in the glass will rise the same when this piece of clay is put in the glass as when the unchanged ball of clay is put in a glass, he is said to conserve volume. In a sample of 30 first-grade children, comparing performance on the first two tasks, a substantial correlation of .63 was obtained, a value statistically significant at the .01 level. The correlation of rod-and-frame with conservation of volume, however, was only .19, clearly insignificant for this sample size. The question to be asked, which cannot be resolved from these data, unfortunately, is whether the high correlation reflects a strong bond between affective and cognitive components of learning the concept of "conservation," or whether the two tasks are cognitively similar almost to the extent of being alternate forms for measuring the same trait or aptitude. Further psychological analysis of these tasks is clearly necessary.

ASSESSMENT OF RESEARCH TRAINING PROGRAM

The research studies described above range from problems in measurement to models for predicting the most basic of achievements, over small samples and large, with a few variables and many. It should be clear that individualization of study was taken seriously as a tenet of our training program. No claims are made to results of prime significance to the educational community, but several recurrent notions were rather effectively laid to rest, a result which might save some time for others. Among these are the idea that personality variables are very important to school achievement. In those studies, we attempted to persuade the participants to include measures of a broader domain of aptitudes and skills as predictors of differential achievement, but the limitations of testing time were strong constraints. As a result, several participants of activist bent who knew what was important, almost to the point of not seeing why they needed to investigate the question, found out that what they believed was not the case. We hope they know, now, why statistical logic needs to be applied to fairly large collections of evidence before a decision is made.

It is our impression that those who began early with a reasonably defined problem, and attended to the methodological issues as they were discussed, even in the abstract, ended up with more definitive studies and clearer results. We would take minor issue with the suggestion reported by our outside evaluative consultant, to the effect that the statistical material should be left until after data are in hand. Educational problems are by nature complex, and students should not expect that simple single-variable probes will be effective. The capability to analyze the data that

must be brought to bear on educational problems cannot be developed overnight. The collection of data itself depends upon the uses to which they are to be put in a statistical analysis leading to answers. The matter of rigor, which some seemed to confuse with difficulty, could have been moderated a bit, with a more concretized approach using extensive examples of data. It was not feasible, however, to assemble rapidly sufficient examples of all the different kinds of studies which the participants envisioned, and thus appropriate generalizations and abstractions were set up and discussed. Later on, during the Fall and Spring terms, as the studies were developing, 15 to 20 hours per week of consultation on statistical analysis and computer procedures were available to students. Only one or two of the participants used this service to prepare themselves to analyze their data. Rather, most waited until data were available in the schools and then, far behind schedule, asked that their data analysis be supervised by staff, a situation which provoked a good bit of the stress characteristic of negative slack.

On the other hand, our participants were scheduled for seminars two afternoons each week. A few trainees were taking additional courses, and most had great difficulty obtaining additional released time from their school districts. This constraint must be considered a partial failure of recruiting. We had hoped that district and school building officials would cooperate to the extent of providing some released time for the research projects our participants were to develop, but this cooperation did not take place on the scale we anticipated. Recruiting teachers for such an intensive project as ours turned out to be should be premised on district support confirmed in advance and, if necessary, accompanied by funds to provide for

teaching substitutes.

In retrospect, we feel that such a training program should begin recruiting during the Fall term, assist participants in problem formulation and collection of baseline data during the Spring term, conduct a workshop using simulated data for computer-based analysis and plan the details of desired intervention techniques and instructional materials during the summer, culminating with a full year for intervention, collecting post-intervention data, and analysis. In short, a reasonable training program involving indigenous school personnel who remain on the job should be scheduled over a period at least 18-21 months in duration for the participants, preceded by a three-month start-up and recruiting period.

The longer training period would permit more exposure, especially through individual study, to foundational information in the behavioral sciences, with which many of the participants seemed distressingly unfamiliar. The other side of the coin, of course, is that the behavioral sciences, as typically presented, do not often provide the immediate relevancy that teachers trained in some programs have come to expect. As a result, discussions of the processes of learning and adjustment, even when focussed " on school settings rather than psychological laboratory or psychiatric institution, tended to become stuck at the introductory level in the attempt to get everybody started. This decision, as is inevitable when groups are heterogeneous, tended to penalize some of the more sophisticated participants. There is also another influence, deriving from the hierarchy of educational jobs, which may have reduced the motivation of some participants for study in the behavioral sciences: more than half of the participants saw their career developing in the area of administration rather than in school-based research.

There are administrative positions in the educational research establishment, to be sure, but one should be first a researcher before attempting to administer such a complex process. This outcome of our training venture should bring reconsideration to an earlier proposal for enlisting those already committed to educational research, and seeking field placements for them in school settings where they can work with teachers and administrators in developing problems and, hopefully, answers.

Recommendations for Research Training

Schedule. A minimum of two years seems essential for effective training and useful output. We continue to believe, at the level of faith, that one learns best how to do research by doing it under supervision. We suggest beginning recruiting in the fall, problem development and baseline data in the spring, plus development of intervention techniques and materials during the first summer; intervention and/or extensive data collection during the academic year; evaluation, hypothesis testing, reporting during the second summer, culminating in a fall presentation to district and community.

Recruiting Pool. If indigenous teacher personnel are to be recruited, and they are as unsophisticated in research techniques as were most of ours initially, the recruitment should be made with consideration of similarity of problems, so that group instruction and peer expectations can interact in the training process (see following section on Problem).

If students already committed to, and having some sophistication in research techniques, are recruited, they should be required to spend a substantial amount of time interacting with teachers, students, and school administrators, so that the problems do not end up as messy non-rigorous pale

copies of classical univariate laboratory studies. These are inadequate, in general, for direct transfer to ongoing problems in schools.

Regardless of which pool is selected, some specific kind of accountability should be arranged. For classroom teachers, research activities should become part of their regular schedule, with a corresponding decrease in classroom contact hours. For research-trained students, some specific internship arrangement with the cooperating school must be worked out. In either case, responsible supervision within the school administrative hierarchy as well as within the university context is essential. A file folder in the superintendent's office is probably insufficient.

Problem. As suggested under the previous topic, attempting to encourage individual projects by personnel who are unsophisticated in research techniques and not overly knowledgeable in the behavioral sciences requires much more in the way of faculty involvement than is likely to be supported, in fact, almost a one-on-one pattern. In contrast, if prior liaison could develop a problem common to several schools, and recruits from those schools could each share in the same major project, the training would benefit from overall structure and the motivation provided by responsibility to one's peers, and the output would be improved because of the opportunities for greater exploration of the necessarily complex issues which must be addressed.

If behavioral science oriented recruits are obtained, there may be more justification for separate projects, although even in this instance the merits of participation in a major team effort are hard to deny.

Academic Credit. Considering the amount of time spent in discussions among ourselves about which existing courses could be used as part of the training sequence, and with participants for exceptions to permit them to

advance toward non-research-related degree objectives, plus the great difficulty of assigning grades equitably when students are so heterogeneous in prior preparation, we are inclined to suggest that a training program be presented and entirely justified with regard to experience and performance competency on specified behavioral objectives. Some of our participants took very lightly the large tuition remission they were receiving, although others made good use of the opportunity. It seems to us more reasonable to operate such a specialized program as a special effort; it should be built upon basic courses now provided by the University, not substitute for them. A certificate specifying behavioral performance competence could be issued. Of course, there are many problems involving salary schedules in schools which would require administrative creativity and flexibility, but that is another story.

EVALUATION REPORT ON RESEARCH
TRAINING PROGRAM

Prepared by:
Dorothy S. Strickland, Ph.D.
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TO: Professor Paul A. Cullinan and Professor Philip A. Merrifield
New York University, School of Education

FROM: Dorothy S. Strickland, Ph.D., Chairman, Early Childhood
Department, Newark State College, Union, N.J.

RE: Evaluation: Model Pilot Program for Training Personnel to
Develop Solutions to Major Educational Problems.

DATE: July 16, 1973

The evaluator spent more than ten hours over a period of two days - June 20 and 21 - gathering the information upon which the following assessment is based. Sixteen of the students involved in the program were interviewed. Most of these interviews were conducted in the presence of Margo Louria, HEW monitor for the project. Several video tapes of students presenting the final reports of their research studies were viewed. In some instances, these were viewed and discussed with the student present. The evaluator also conferred with Professors Cullinan and Merrifield along with Ms. Louria. At that time, questions were answered regarding the materials (proposal and project reports), which had been made available beforehand.

Student opinion of the program was extremely favorable. The reasons given for their enthusiasm fell into several broad categories which were constantly repeated by different individuals throughout the interviews.

1. Positive impact on the school districts involved.

Students overwhelmingly agreed that the scope of their involvement in the program went beyond their own personal needs. Many of the research projects grew out of problems which had already been pinpointed by persons within the school district as being in need of investigation. Others were developed by the students on the basis

/ district problems of which they had personal knowledge and interest.

The following are some examples of the contributions made to the school districts:

- a) A mathematics program will be developed from the results of one study. It will be geared to the needs of the district in which it was developed and used in that district.
- b) One study involved daily reading aloud to children as a means to increase reading ability. It not only proved to be a successful technique for reading instruction, but it also caused a number of teachers, who rarely read aloud to their classes, to do so on a regular basis.
- c) An English-as-a-Second Language Program was developed as a result of one research project. It will be implemented in the district involved.
- d) Another study involved the development of diagnostic and corrective procedures for reading instruction. These procedures have been adopted for use by Project Redesign, a district-wide curriculum project.
- e) On the basis of her study, one researcher received a mini grant to develop a guidance program for the junior high school in her district.
- f) The Manpower Development Program for which one student is employed, has accepted many of the recommendations resulting from his study and has already begun to implement some of them in its basic education and career skills programs.
- g) Another study involving an investigation of the sociological and

educational characteristics of teenage gang members, has resulted in the development of a program for parents of such youth.

2. Personal notice of students as potential leaders in the district.

Most students felt that their contributions to the district as researchers, brought them recognition as candidates for administrative and supervisory positions.

Specifically, one student will become administrative assistant to the principal in her school next year. Another was promoted to the post of Educational Coordinator. Several others stated that they will either receive promotions or are being considered for promotions largely because of the greater visibility and credibility afforded them as a result of their work in this program.

3. Favorable comparison of this approach to research training as opposed to traditional training programs.

Students were asked to assess the value of this method of research training. Typical among the responses given were:

- a) The program offered freedom to work in ways other than that of traditional course work.
- b) The program was far more rigorous than any other in which most students had been involved.
- c) Because of their practical nature, the field seminars were cited as being extremely valuable.
- d) Students who had previously been in educational training programs which lasted for one summer only, stressed the fact that the one year length of this program provided for sufficient follow-up and insured greater growth.

- e) Relevancy of the projects and the responsibility to the school district provided greater motivation than one would ordinarily have.
- f) The flexible nature of the program allowed for greater individualization than traditional approaches. It should be mentioned here, that students were extremely generous in their praise of Drs. Cullinan and Merrifield. They spoke highly of the strong group feeling which developed during the training period.
- g) Students felt that because they were conducting needed research within their own school districts, other school personnel involved were more cooperative than they might otherwise have been.
- h) Learning in a problem context was considered valuable. Students favored the problem solving nature of the program.

4. Educational aspirations raised.

Most students have expressed a desire to go on for further study. At least two have already matriculated in doctoral programs.

5. Suggestions for the future.

- a) Students suggested a change in the sequence of courses. Statistics would be delayed until students have a greater need for such procedures and a greater understanding of research techniques rather than offered as one of the first courses.
- b) There was a concern that more be done beforehand to insure full cooperation from the school districts involved. Although these problems were resolved eventually, some research projects were delayed because of what appeared to be a lack of communication.
- c) It was also suggested that prospective candidates be given a clear understanding of the rigorous nature of the program, beforehand.

It was not recommended for the undisciplined person.

Based on the evidence presented above, the evaluator would rate this project as one which has clearly fulfilled its goals.

Based in urban settings, the trainees involved have identified problems in need of investigation. They have worked closely with a wide variety of school personnel in order to develop and implement plans for attacking those problems. Trainees gained recognition and praise for their efforts. In many instances their research has been given further support and approval for expansion by the district. These students shared a deep sense of commitment and pride in the work accomplished during this project.

Barry J. Strickland

APPENDIX I

44

RESEARCH IS FOR ANSWERS

Answers to what?

To school-based problems, generated by school-based people

Research by whom?

By school-based people, chosen with district cooperation, and trained for work on individual problems by selected NYU faculty.

When does it happen?

July 3, 1972, is the beginning of the fulltime intensive summer workshop; individual research problems formulated there will be carried out during the school year as part of the participant's regular school assignment. Two field seminars weekly will bring NYU faculty to school districts for cooperative work on problems.

What about expenses and course credit?

During six weeks of the summer, each participant has a \$75 weekly stipend; during the rest of the program, travel expenses up to \$10 weekly to attend field seminars and come to the University.

The full program provides 20 points applicable to graduate degrees, for qualified participants, in educational administration or in educational psychology. All tuition charges are remitted.

Who are involved?

Funding is from the U. S. Office of Education,
National Center for Research and Development

Faculty from New York University School of Education, programs in Educational Administration, Psychology, and Statistics, and Early Childhood and Elementary Education; curricular emphasis as desired at elementary or secondary level in language learning, mathematics, science or social studies.

Finally, you and other participants willing to spend a full summer and a busy school year learning while doing research.

SHAPING THE PROBLEM

What's bothering you?
Can you verbalize your concerns?
Can you really get down to cases?
What's in the literature?
Putting your hunches into hypotheses, and their alternatives.

ASKING THE RIGHT QUESTIONS

What do you need to know?
What instruments to use?
Confidence in responses.
Utility of responses.
Making your own instruments.

GETTING IT TOGETHER

Collecting your data from an appropriate sample.
Using the computer to turn data into information.
Answering your questions by testing hypotheses.
Considering alternative explanations.
Setting reasonable limits on conclusions.

PRESENTING THE MESSAGE

Significance, relevance, and utility.
Inferences and recommendations for action.
Verbal and graphic communication.
Preparing and presenting your report.

The six-week summer workshop will emphasize I and II above, with special emphasis on II during individualized study late in August. Discussions of formative evaluation, interactive development of researchable problems, and relevant literature will be stressed in the field seminars during the school year, along with III and IV above. A report will be prepared for presentation to district personnel and others interested in May 1973, in which IV will be actualized.

Participants must have the following requirements:

- B.A. from accredited school
- District approval for time to spend on research

Discrimination Prohibited

Title VI of the Civil Rights Act of 1964 states: "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

The training program here described is operated in compliance with this law. In addition to this, Executive Order 11246 (effective October 13, 1963), the contractor will not discriminate against any employee or applicant because of race, color, religion, sex, or national origin.

SCHEDULE

Summer Workshops Daily, 10-4

July 3-21: Foundations of Research

July 24-Aug 11: Measurement and Statistics

Weekly Stipend \$75 July 3-Aug 11

Aug 14-Sept 1: Individual work on researchable problems

Sept-May: Field seminars in methods and cognate areas

May, 1973: Progress report to District and community

Model Pilot Program
Training Research Personnel
Department of Educational Psychology
933 Commerce Building
50 West 4th Street
New York, New York 10003

Postage

PROGRAM STAFF

Co-Directors

Paul A. Cullinan - administration
research studies

Philip R. Merrifield - measurement,
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Staff

Robert Beech - social psychology,
learning, value systems

Lloyd Bishop - individualized
instruction, secondary educ.

Bernice Cullinan - language arts,
reading, elementary educ.

Donald Payne - educ. technology

Lenore Ringler - remedial reading,
learning disabilities

Carolyn Saarni - Piagetian tasks,
cognitive development

Sharon Weinberg - statistical
analysis, research design

Staff names above are fulltime
faculty, School of Education,
New York University.

Colleagues from other sectors of
the School are available to partic-
ipants as students.

Computer services will be provided
through the School of Education at
no charge to participants for
program-related problems.

A MODEL PILOT PROGRAM FOR
TRAINING PERSONNEL TO DEVELOP
SOLUTIONS TO MAJOR EDUCATIONAL
PROBLEMS

598-2659 or 598-2919

APPLICATION FOR RESEARCH TRAINING OEG 0-72-1263 NEW YORK UNIVERSITY

YES, I am interested in participating in the program described in this brochure.
I will seek approval from my district to work on research next year and will plan
to continue research activities after I complete the program.

NAME _____

TELEPHONE _____

ADDRESS _____

ZIP _____

SCHOOL, DISTRICT NO. _____ MY PROBLEM INTERESTS ARE _____

MAIL BY JUNE 15. PARTICIPANTS SELECTED WILL BE NOTIFIED BY JUNE 23.
If you need more information, call Prof. Cullinan, 598-2919, or Prof. Merrifield,
598-2659.

APPENDIX I

THE SCHOOL OF EDUCATION
OF NEW YORK UNIVERSITY

offers

A one year program in Educational Research Training
for School District Personnel

July 3, 1972 - June 30, 1973

In cooperation with
The National Center for Research and Development
U. S. Office of Education
Washington, D. C.

Program Objectives

This program is specially designed as a "new directions" or career renewal for persons who intend to serve in a research and development role in school systems. The emphasis in recruiting, training and service is directly linked to local school districts. Participants will be affiliated with a school district during the period of their training with agreement and approval from their district board and administration that they will have responsibilities of a research and development nature upon completion of the program.

Training will be based on the development of solutions to real and current educational problems identified by teachers in their own environments. The relationships between the school districts and the university will emphasize training in field settings so that learning and application of skills may be done in operational setting.

The research training program is comprised of four components: (1) Summer Institute, (2) Individual Problem Design Phase, (3) School-year Seminars and Consultation Sessions on Individual Research Problems, and (4) an Individual Project Report.

The training program seeks to develop participant skills in understanding and conducting research activities with a view toward the application of findings for remediation school district educational problems.

The primary areas of behavioral objectives are:

1. Definitional Skills - includes the understanding of how researchable problems are identified, how previous research is reviewed and abstracted, use of ERIC system.
2. Conceptualization Skills - includes the competencies to relate educational problems to instructional strategies, organizational arrangements, previous findings, and implications for practice.
3. Design Skills - includes the abilities to plan (e.g., PERT skills) and implement a research strategy. Knowledge necessary for the development or adoption of tactics (instruments, interviews, observations) and modes of data collection must also be manifested.
4. Quantification Skills - includes basic understanding and competence in methods of data analysis and statistical inference.
5. Interpretation Skills - includes the abilities to evaluate results in terms of decision-oriented or conclusion-oriented situations. Skills in the areas of diffusion and dissemination are also implied. Close coordination will be maintained with programs training those who will develop new curricula based on research results.

While these research skill areas reflect, at least in part, some of the conventional tactics taught in methodology courses, there is a conscious intent and planned approach to avoid "fitting of students" to existing university courses. The training team represents an interdisciplinary group of junior and senior faculty who are committed to inductive and problem-related approaches to instruction.

For example, the introduction of trainees to the skills of problem identification will be through the use of data and findings from evaluations of compensatory programs in their own school districts. (New York University has conducted such studies in nearly every district in New York City and multiple copies of these reports are available.) The sources and meaning of these data will be discussed and the skills needed to define researchable problems stemming from such studies will be explicated. Trainees will have responsibilities for developing their own major and minor research studies of problems they identify, and reporting the research they conduct on locally pressing issues. Participants will also maintain a "log" of activities and experiences associated with carrying out research projects, to be reviewed in seminars and eventually incorporated into research process guides.

The Program

The format for training stresses that the participants will continue to serve in their school districts as they engage in the program. The training sequence would consist of these phases:

- | | |
|-----------|---|
| 6 Credits | <p><u>Phase 1.</u> (July 3, 1972-August 11, 1972) Summer Institute. A six-week initial training institute to introduce participants to the areas of Definition, Conceptualization, and Design Skills.</p> |
| 1 Credit | <p><u>Phase 2.</u> (August 14, 1972-September 1, 1972) Problem Design. Participants will identify researchable problems in their own school district, develop the initial conceptualization and design, obtain administrative approval for arrangements whenever necessary.</p> |
| | <p><u>Phase 3.</u> (September 18, 1972-May 25, 1973) Inservice Training. During this school year period the participants would spend two afternoons per week in seminar work, at least one of which would be conducted in the school districts with appropriate participation of administrative staff, teachers, and community representatives who might bring perspectives and data to bear on participants' research problem. Emphasis upon Quantitative and Interpretation Skills would emerge during this period of time.</p> |
| | <p><u>Phase 4.</u> (May 25, 1973-June 15, 1973) Report of Research Study. Trainees will have written their reports on the major problem studied during the training period prior to May 25. Presentation to district staff and community representatives would be made along with conclusions and recommendations for action.</p> |

Eligibility

Candidates for the training program must meet the following criteria:

1. Possess at least a Bachelor's degree from an accredited college or university.
2. Express a commitment to serve in a research and development capacity in a school district.
3. Provide written approval from appropriate school district officials of arrangements necessary for participation and school system intent to support such a role.

Period of Training

The training program will begin July 3, 1972 and extend through June 30, 1973. Participants will enroll as regular or special students at New York University. The program schedule follows the University summer and academic year calendar:

Stipends and Benefits

Participants will receive \$75 per week during the six week summer session and \$10 per week travel allowance during the academic year. Tuition will be waived for twenty points of academic credit.

Discrimination Prohibited

Title VI of the Civil Rights Act of 1964 states: "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance." The training program described here is operated in compliance with this law.

In addition to the above, executive order 11246 (effective October 13, 1963), the contractor will not discriminate against any employee or applicant because of race, color, religion, sex, or national origin.

Program Staff

Co-Directors:

Dr. Paul A. Cullinan, Associate Professor, Division of Educational Administration,
Dr. Philip Merrifield, Chairman, Department of Educational Psychology

Staff:

Dr. Robert Beech, Learning Theory and Research on Values
Dr. Lloyd Bishop, Individualized Instruction and Secondary Education
Dr. Bernice E. Cullinan, Early Childhood and Elementary Education,
Reading and Language Arts
Dr. Fred Kerlinger, Research Design and Methodology
Dr. Donald Payne, Educational Technology and Research Methods

Staff (continued)

Dr. Elazar Zedchazur, Measurement, Research Design and Methods of Analysis
 Dr. Lenore Ringler, Reading, Language and Learning Disabilities
 Dr. Carolyn Saarni, Child Development and Learning Theory
 Dr. Sharon Weinberg, Educational Statistics and Research Design

Application Procedures

Applicants should complete the regular application form for admission to the Graduate School of Education, New York University and mail it to Dr. Philip Merrifield, 933 Commerce Building or Dr. Paul A. Cullinan, 4 Washington Place on or before June 15, 1972. Decisions about admissions will be made immediately thereafter.

APPLICATION REQUEST

☐ I am interested in the program. Please send an application form to:

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

☐ I recommend that you send information about the program to:

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

OR Telephone (212) 598-2919
 598-2951

APPENDIX II

ACCEPTANCE OF PARTICIPATION IN THE
MODEL EDUCATIONAL RESEARCH TRAINING PROGRAM

Name _____

Social Security No. _____

I will be a participant in the Model Educational Research Training Program from July 3, 1972 to June 30, 1973. During this time I will attend the Summer Training Institute, construct a research design in cooperation with school district personnel and University staff, conduct the research with the assistance of University staff, and present a final report of research to District personnel and the University staff. If given approval and support by my school district, I anticipate using the training in a position commensurate with the research skills developed.

Signature_____
Date

MEMORANDUM OF AGREEMENT

DISTRICT

SCHOOL

On behalf of the District (School) noted above, I agree to facilitate the research efforts of _____ during the academic year 1972-1973. It is understood that the research project will be developed with district and/or school consultation and will be appropriate for credit in the Model Educational Research Training Program at the School of Education, New York University.

Facilitation of research is understood to include access to student records, reasonable access to students for new evaluative data, and reasonable arrangements for attendance at seminars, to be scheduled twice weekly in the field, or, upon occasion, at New York University.

Moreover, if the above named participant successfully completes the training program, consideration will be given to role responsibilities for the participant during the 1973-1974 year that will use the training and skills developed by this program.

Name

Title

Date

Please return this form to:

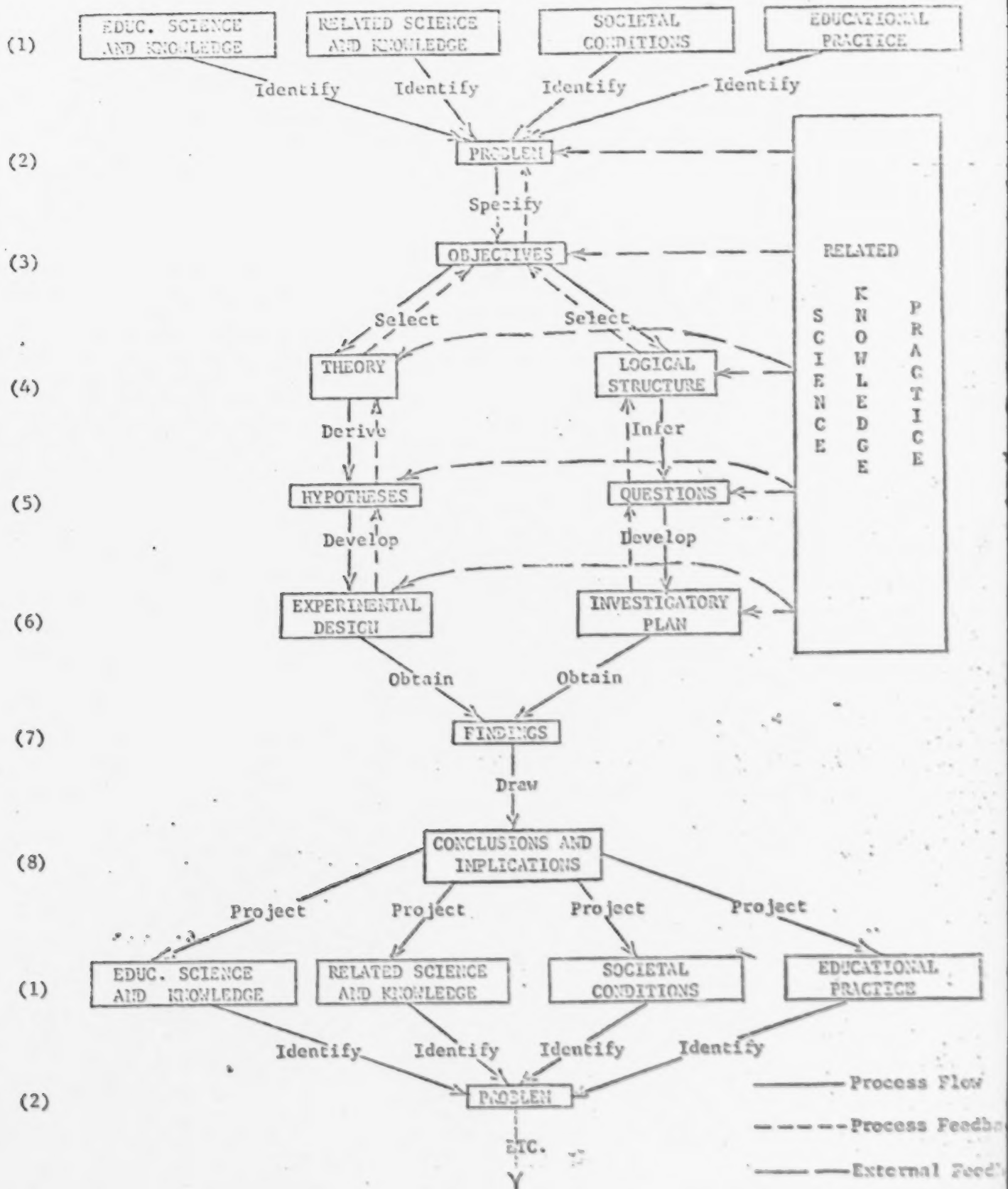
Model Educational Research
Training Program
80 Washington Square East, Room 28
New York, New York 10003

APPENDIX IV

MODEL EDUCATIONAL RESEARCH TRAINING PROGRAM
ROSTER OF TRAINEES

TRAINEE	SCHOOL DISTRICT	AREA
Marlene Behrends	District 7 Bronx	Early childhood
Jane Doman	District 24 Queens	Elementary
L. Celestine Evans	District 28 Queens	Early childhood
Lawrence Glass	District 27 Queens	High school science
Gwendolyn Hadley	District 24 Queens	Elementary
Daniel S. Hill	District 2 Manhattan	School psychology
Jeffrey Hollander	District 24 Queens	Drug education
Anne Ming Leong	District 2 Manhattan	Elementary
Brendan Maiers-McGraw	District 24 Queens	Bi-lingual, ESL
Andrew Osborne	Manpower Career Development Agency	Adult education
Kathleen Pfennigwerth	Elwood, Long Island	Reading coordinator
Joseph Powlis	District 7 Bronx	Drug education
Waldemar Rojas	District 8 Bronx	Community relations
Nancy Scott	District 23 Brooklyn	Language arts
Rita Siegel	District 24 Queens	Guidance
Dorothy Smith	District 7 Bronx	Administration
Hyacinth Stevens	District 7 Bronx	Administration
Donald Teal	District 16 Brooklyn	Mathematics
Bernice Wiley	District 18 Brooklyn	Black history
William Zuckerman	Great Neck	High school science

A FLOW CHART OF THE EDUCATIONAL RESEARCH PROCESS



MODEL EDUCATIONAL RESEARCH
TRAINING PROGRAM

Example No. 1

Mr. Smith did his master's thesis on "Effects of films on attitudes about U.S. Asian policy. He properly selected his sample from his region and administered a pretest. He then showed a set of three films over a month's period and used an alternate form of the attitude test to measure changes. Assuming these procedures were adequate, what can you say of his study with respect to various criteria of internal validity?

- (A) if the study had been done in May, 1970
- (B) if the study had been done in April, 1972

Example No. 2

Hypothesis: Intensive counseling can effectively improve the attitudes toward school of extremely negative students.

Procedure:

1. Test of attitudes toward school for all students in the school
2. Choose lowest 10% and engage in intensive counseling for a 3-week period.
3. Re-test the entire school
4. Compare the mean change in attitude of the experimental group to the mean change in attitude of the remainder of the school.

Example No. 3

Hypothesis: High-interest, low-reading level materials are more effective in teaching social studies to slow readers than conventional texts.

Procedure:

1. Select teacher volunteers to use the new materials while other teachers teach control groups with conventional texts.
2. Pre-test students and randomly assign to experimental and control classes.
3. Post-test students on an alternate form of the same test (a social studies achievement test).
4. Compare the mean rate of improvement for the two groups.

Example No. 4

A randomly selected group of female teachers was asked to try a weight-reducing preparation. Each morning they were weighed and the rate of weight loss was three times that of a matched group which was weighed before and after the treatment but which did not take the weight reducing preparation.

Example No. 5

Miss Brown did a master's thesis on "Creative Writing in Elementary Schools." The experimental groups of children, who had been taught "creative writing" submitted poems along with the control groups who had not had such instruction. To guard against special treatment, her three judges each read fifty poems from the control group before reading the same number of poems from the experimental group. Since as many or more poems judged "creative" were from the control group, the experimental program was dropped.

Example No. 6

Hypothesis: Multi-media approach is more effective in teaching science than conventional techniques

Procedure:

1. 100 summer school science students.
2. Randomly assign to each of four classes (2 experimental, 2 control).
3. Two teachers are used; each teaches one control and one experimental class.
4. Pre-test each of the 100 enrollees and post-test each of those who complete the course.
5. Compare changes in the mean achievement test scores, control v. experimental groups.

Example No. 7

Jones wished to study unionized teachers' attitudes toward the contract offered by the Board of Education during a recent teachers' strike. The first three days he interviewed teachers in some less privileged areas of the city, the next three days he interviewed teachers in rather "average" schools, and the last three days he interviewed teachers at more "preferred" schools. Although all interviews were made on the picket line, the results seemed to differ sharply and he concluded that these differences were attributable to differences in the schools.

RESEARCH DESCRIPTION SUMMARY

RESEARCHER: _____

District No. _____
Superintendent _____

Principals of schools involved in study: _____

TITLE OF STUDY: _____

ERIC DESCRIPTORS: _____

DATA COLLECTION SUMMARY

Students: N = _____ Characteristics and sources: _____Teachers: N = _____ Characteristics and sources: _____Parents/Community: N = _____ Characteristics and sources: _____

Tests and Scales:

<u>N</u>	Title & Publisher (Developer)	\$Each	Total
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____

Date of Collection for Instruments:

<u>N</u>	Date
1	_____
2	_____
3	_____
4	_____
5	_____

RESEARCH DESCRIPTION SUMMARY

60

DATA ANALYSIS SUMMARY

Scoring Needs (By Instrument):

INSTRUMENT

1

Scoring

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

Statistical Procedures

- 1 _____
- 2 _____
- 3 _____
- 4 _____

Data Processing Dates

Date

- 1 _____
- 2 _____
- 3 _____
- 4 _____

REPORT OF RESEARCH

Report Preparation and Interpretation (Consultant/Date)

Consultant

Date

Consultant

Date

- | | | | |
|-------|-------|-------|-------|
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |

Time expended by Consultant to _____

Date

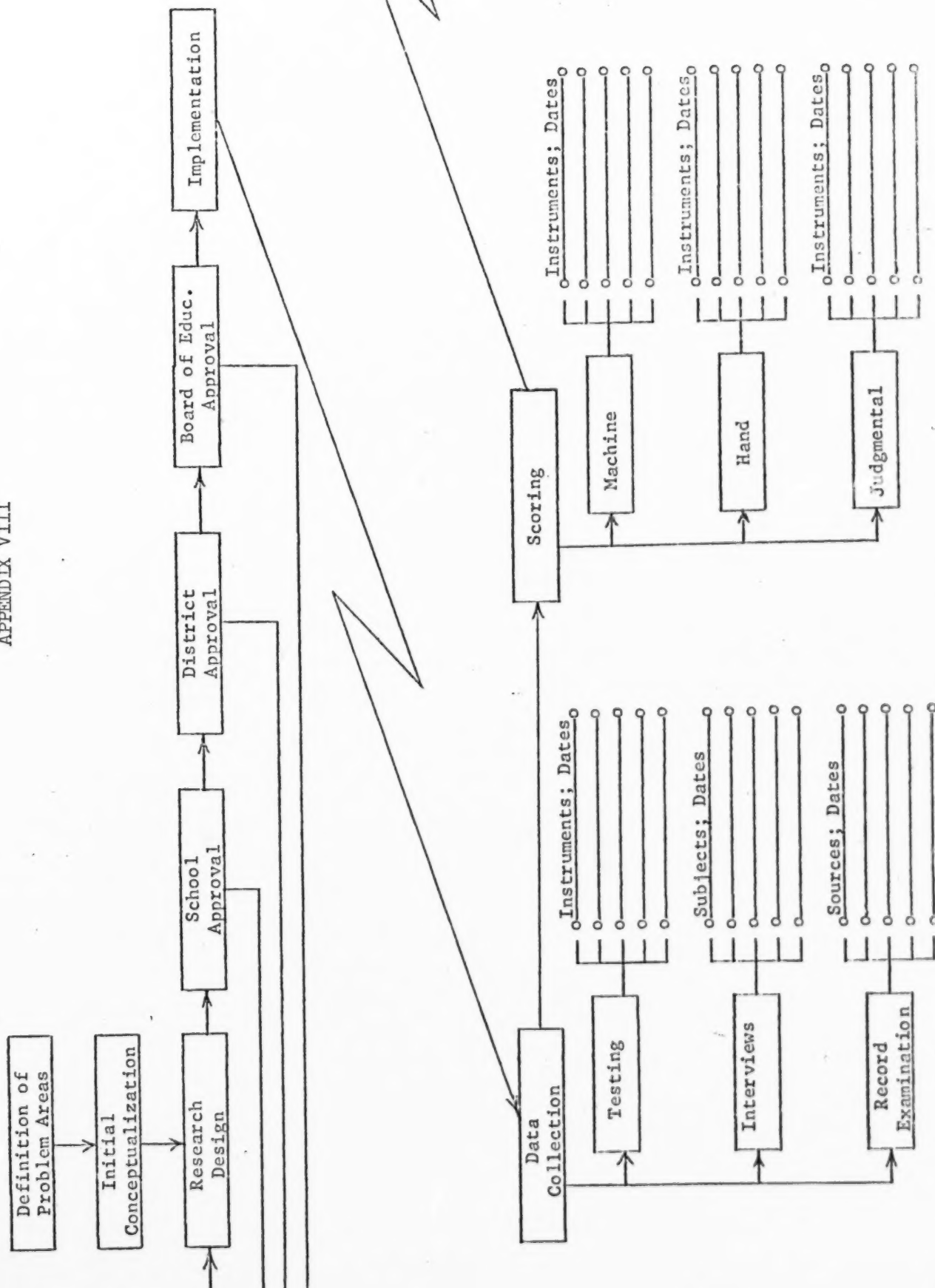
- | | |
|-------|-------|
| _____ | _____ |
|-------|-------|

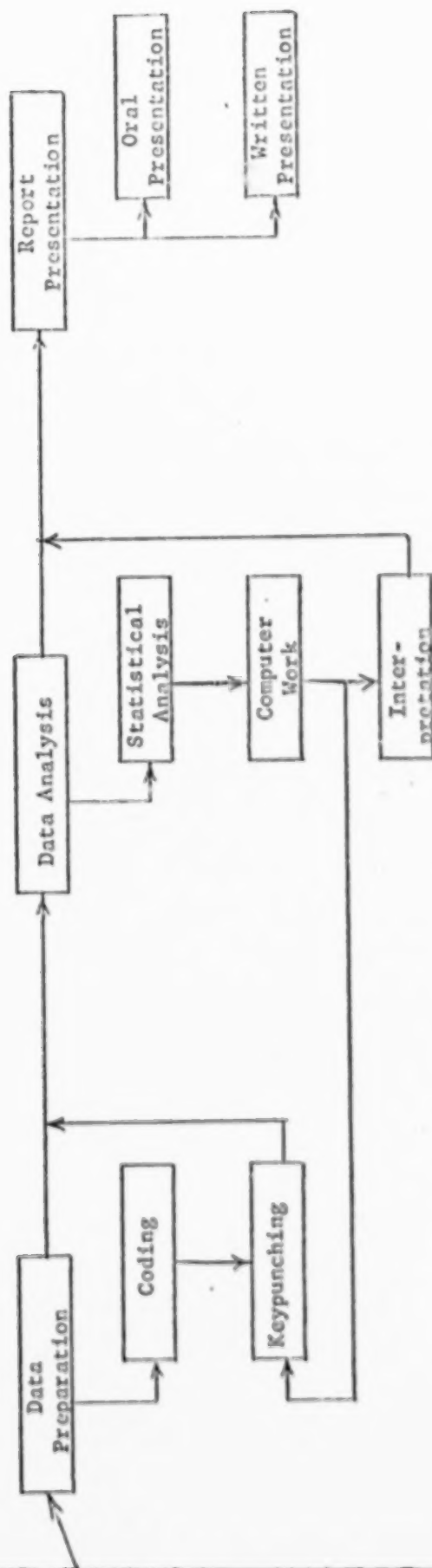
Other Notes

- | | |
|-------|-------|
| _____ | _____ |
|-------|-------|

Large Print Edition

APPENDIX VIII





Model Educational Research Training Program

Report on Social and Organizational Context of Study

Develop for your NERT study a section dealing with the social and organizational setting or context within which your inquiry was done. The purpose of this section is to delineate for the reader the distinctive or unique characteristics of the situation where your data were gathered. In developing this section use a narrative style but cover the major areas and indicators listed below.

A. The School(s) Community School District Identity

1. Name of school(s)
2. Level or type
3. Size of school (A.D.M. and A.D.A.)
4. Building(s) description
 - a. age of building and additions
 - b. condition of building
 - c. per cent utilization
 - d. other interpretive features

B. The School Area

1. Geographic location of school(s)
2. Neighborhood description
3. Attendance area information
4. Relevant school area characteristics
(e.g. near other schools, feeder or fed)

C. School and Community

1. Distribution of pupils
 - a. Racial and ethnic
 - b. SES
 - c. Language (if applicable)
 - d. Optional Assignment
2. Community population profile
 - a. Racial and Ethnic
 - b. SES
 - c. Language
 - d. Occupational

D. School Organization

1. School Staff
 - a. Size
 - b. Composition
 - c. Special Characteristics

APPENDIX X

MODEL EDUCATIONAL RESEARCH TRAINING PROGRAM

64

EVALUATION OF RESEARCH REPORT

Student Name: _____

Date: _____

Report Topic: _____

Type of Report: _____

SUBSTANTIVE FEATURES OF THE REPORT

	Poor	Fair	Good	Excl.
1. Logical organization of material				
2. Research procedures and findings				
3. Elucidation of research implications				
4. Appropriate & adequate visual displays				
5. Adequate responses to questions				

FORMAL FEATURES OF THE PRESENTATION

1. "Heads up" presentation				
2. Verbal stylistics (phrasing, etc.)				
3. Style appropriate for laymen				
4. Contact in eliciting/answering questions				
5. Reference to visual displays				
6. Appropriate eye contact				
7. Appropriate gestures				
8. General "presence"				

COMMENTS: _____

Observer: _____

APPENDIX XI

SELECTED STUDENT REPORTS

The five student reports which follow are summarized above as Reports No. 1, No. 2, No. 3, No. 10, and No. 12. Some retyping was done to prepare reports for duplication and to improve format where necessary. However, no substantive changes have been made, and remarks and notes which were made by the project co-directors have been deleted, except where noted. Each report is presented here as a complete document, and appendixes referred to in the text follow each respective report.

(This study is summarized above as Report No. 1.)

LANGUAGE ARTS DIAGNOSTIC EXAMINATION
Elwood Junior High School

Submitted to:
Model Educational Research
Training Program
School of Education
New York University

FOREWORD

The perspective that I chose to take during my Model Research Training experience was that of a classroom teacher looking for pragmatic applications of the skills to be acquired. I am convinced of both the benefit and necessity of "front line" personnel, teachers, being familiar with such rudimentary concepts as Mean, Standard Deviation, etc., and possessing the slightly more complex ability of being able to discern when sets of scores are or are not statistically significant and why.

In the face of increasingly negative criticism of the educational processes and increased disparity of skills in the student populations that are dealt with, I believe it is vital that teachers begin to think in terms of setting individualized goals for students and be able to prove, with some degree of certitude, that these goals have been achieved. Individualization and accountability are upon us, and intuitively I feel that it will be far better for the populations served if local educators determine the what and how of their implementation.

My opportunity to utilize the MERT experience in a practical way came early in the academic year 1972-73 when the Department Chairman of the suburban Long Island junior high school where I teach announced that it would be necessary to devise and administer a Language Arts Diagnostic Examination to our 1100 students. My research project consisted of working with other members of my department in planning the test, an extensive analysis of the data acquired, and participation with my colleagues in mapping out specific plans for action after due consideration of what had been learned.

In 1971 the Cooperative Review Service of the New York State Education Department conducted a lengthy and expensive examination of the Elwood Public

Schools, Union Free School District #1, Town of Huntington, New York.

Four, one-sentence indications of the "areas of the English program in which most improvement is needed" appeared on page 111 of a 289 page final report. Many of the language arts teachers voiced mild agreement or disagreement with what had been found, and the recommendations for areas most in need of improvement remained on page 111.

From October, 1972 to June, 1973, a varying number of teachers in the English Department of Elwood Junior High School worked on an analysis of data collected from a self-devised Language Arts Diagnostic Examination. As a result of that experience a great deal of soul-searching has been done by the various faculty members involved, new norms applicable to our particular school district will be considered when utilizing standardized tests in the future, and half of next year's seventh and eighth grade will be involved in a totally new individualized program. Teachers participating in this program (LASET), Language Arts Seven, Eight Team, will be familiarized with basic research skills for their record-keeping and evaluation responsibilities.

The total of this past year's experience has further convinced me of the validity of a pet hypothesis: there is a positive relationship between the degree to which research or evaluation will effect change in an educational institution and the knowledge of the formal and informal operations within that institution the researcher or evaluator possesses.

INTRODUCTION TO ELWOOD

The following introduction to Elwood has been adopted from the beginning chapters of a 1971 report by the Cooperative Review Service, New York State Education Department, as it was perceived that a more than adequate job was done in describing the community and its school district.

Elwood Community

The Elwood community draws its identity from the Elwood Union Free School District No. 1, an area of some five and one-half square miles, nestled in the Huntington Township. Elwood is basically a residential community with a population of approximately 16,000. The life of the community revolves to a great degree around the schools.

The Elwood community, synonymous with the area served by the Elwood School District, is bounded by Clay Pitts Road on the north; Broadway-Greenlawn to the west; Larkfield Road on the east; and Jericho Turnpike and Daly Road to the south. This once pastoral setting changed drastically in the 1950's from an agrarian environment to a commuting community.

The landscape of fertile farmlands, scattered rural houses, the general store, the vestiges of a simpler, less complex existence underwent a metamorphosis. Suburban housing began to dot the countryside as families from the metropolitan area moved eastward to enjoy the bucolic advantages of Western Suffolk County.

Although the farmlands gave way to verdant lawns, split-levels, colonials, and patios, the community has retained much of its semi-rural flavor. No longer does "Clay Pitts Path" lead to deposits of clay nor do the larks nest in the abundance of former years, but the area remains almost

exclusively residential. A small industrial and business zone hugs the heavily-traveled Jericho Turnpike, but this is the extent of industrial growth within Elwood's boundaries.

As a part of the Township of Huntington, the Elwood community shares in the broader cultural, business, recreational, and religious opportunities available in the Township. Huntington is one of the largest of ten towns in Suffolk County, one of the fastest growing counties in the United States. The town occupies about 100 square miles, contains seven other school districts and is located about thirty-five miles east of New York City.

The Elwood District is surrounded by local shopping areas. Huntington's libraries, museums, theatre groups, orchestras, and art galleries bear testimony to the townspeople's strong support and interest in cultural pursuits. Churches of many faiths and denominations and synagogues provide a spiritual life for residents.

A commuter railroad puts Manhattan about seventy minutes away. The Long Island Expressway and Northern State Parkway, which are about five minutes drive from Elwood, link the community with bustling Nassau County and New York City. The Town enjoys miles and miles of sandy beach along Long Island Sound with superb facilities for swimming, boating, and fishing. Twenty minutes to the south, the Atlantic Ocean duplicates these assets. Thus, the Elwood community offers a suburban life still rural-paced along with the rich opportunities afforded by the proximity to United States' largest urban center.

Elwood School District

The history of the Elwood School District is closely interwoven with the development of the Elwood community. The growth of the School System

parallels the changing population patterns of the community. In the early years of the twentieth century, the sparse population of this rural area was served by a two-story frame building located on Cuba Hill Road, which is known today as the "Little Red School House" and is utilized for the District Administrative Offices.

The four-room structure was adequate for the educational needs of the Elwood community until the early fifties when the influx of new residents began to have an impact on the future requirements for providing an educational program for the incoming tide of students. Accustomed to student populations of one hundred or less, the District recognized the facility inadequacies as studies projected enrollments beyond existing capabilities. A proposed school centralization of Elwood and Commack was considered and vetoed by the voters of the two districts. It became apparent that Elwood would have to move toward additional facilities to contain its elementary needs. Secondary students were "farmed out" to three school districts.

Thus, suburbia began to overtake Elwood along with all the concomitant changes associated with this phenomenon. Cuba Hill Elementary School was opened in September, 1955, and two years later an addition was completed. In the fall of 1958, the Manor Plains Elementary School opened, providing twenty-eight more rooms for elementary expansion. Cuba Hill School expanded even further with the opening of a very large new unit in 1965. This addition to Cuba Hill increased the classroom units to an overall total of 38.

The newest of the elementary schools, Harley Avenue, was occupied in September, 1966, with twenty-eight rooms available. Presently, these three elementary schools contain the District's elementary program with K-6 grades

housed in each building. During these years of construction, the grade organization in each school was altered periodically as the District's housing needs changed.

Ground was broken in the Fall of 1960 for the construction of John H. Glenn Junior-Senior High School, the first secondary facility to be erected in Elwood. The imposing building was opened in September, 1962, for 7-12. This eventful stage in the growth of Elwood's educational system climaxed years of preparation and for the first time provided the Elwood community with a District K-12 School System.

As the secondary school population burgeoned, the need for additional facilities became apparent. In September, 1968, a separate Junior High building was completed and occupied. Beginning as a 7th and 8th grade organization, the Elwood Junior High School moved to a 7-9 grade structure in 1970.

Currently, the five schools comprise the Elwood School System. Student population projections are beginning to stabilize, and facility requirements of the future are being studied.

RESEARCH AND RESULTS

The Language Arts Diagnostic Examination

"The basic purpose of the Elwood Schools is to assist each child individually to achieve his or her full intellectual and social development consistent with his or her capabilities." This published statement has appeared within the context of explaining the educational philosophy of the Elwood Public Schools.

There is a strong movement within this district toward individualized instruction. The first step in individualization is diagnosis, and that is why the English teachers in the Junior High were asked early in the school year 1972-73 to devise and administer a Language Arts Diagnostic Examination.

Through teacher meetings and extensive departmental planning, it was decided that a test would be prepared which would indicate student strengths and weaknesses in grammar usage in fifteen skill areas. The test which was devised appears in Appendix I. It is composed primarily of excerpts of work-book materials used within the district. Uniform administration and scoring procedures were utilized. Students were given as long as they needed to complete the test, in some cases, up to four days of class time (45-minute periods).

It is, regrettably, true that time did not allow our doing a thorough job in researching the reliability or validity of the test that was devised. While this may seem like a traumatic statement to the seasoned researcher, it was borne in mind that the emphasis of this learning experience was to have been practical. The test would have been devised and administered in any event, and had there not been faculty pressure to look at the scores in some statistically meaningful way, the teachers probably would have wound up

reporting and looking at nothing more meaningful than total scores based on 100%.

Inroads in the Elwood Junior High School, at least in the English Department, have been made into looking at our everyday testing procedures with more of a critical "research oriented" eye. When the Language Arts Diagnostic Examination is administered next year, arrangements have been made for alternate from reliability testing. This was deemed a better method, for this particular examination, than the Split-Half or Kuder-Richardson formulas. Next year we will also seek to establish concurrent validity for the various subsections by relating selected student performance on the Language Arts Diagnostic Examination with performance on another, hopefully standardized, well-reputed test.

Means and Standard Deviations by Skill Areas and Grade Levels

In addition to the fifteen grammar skill areas covered with the examination, it was decided to include in the analysis the results of a school-wide standardized reading examination (California Achievement Test-Level 4), the first quarter Language Arts grade, and the results of a Mathematics Fundamentals Test. In the following tables the means and standard deviations are reported by grade level according to the variable numbers indicated on the following page.

Analysis of Mean Scores

The following items have been deemed areas for further inquiry, thought, etc., after consideration of the mean skill scores.

1. A junior high school with a mean reading score of 9.1 in

TABLE I

Variable No.	Item	Total Possible
01	CAT Total Reading Score	(These items are reported by grade level scores.)
02	CAT Vocabulary Score	
03	CAT Comprehension Score	
04	Sentence Recognition	10
05	Subject Recognition	10
06	Predicate Recognition	10
07	Comma Usage	30
08	End Punctuation Usage	14
09	Troublesome Verbs:	20
10	Verb Tense	40
11	Capitalization	15
12	Plural Nouns	12
13	Possessive Nouns	06
14	Pronouns	40
15	Possessive Pronouns	07
16	Contractions	03
17	Total of 15 and 16	10
18	Antecedents and	12
19	Corresponding Pronouns	12
20	Total Raw Score, Language Arts Diagnostic Examination	251
21	First Quarter Language Arts Grade	08*
22	Math Score	100**

*Grades were recorded as follows: F-1, D-2, C-3, C+-4, B-5, B+-6, A-7, A+-8.

**For 7th and 8th graders, the math scores were computed from the Math Fundamentals Exam administered by the faculty of the Mathematics Department at Elwood Junior High. This is a test of thirtyfive items that measures basic computational skills. For the 9th graders, scores were obtained from the New York State P.E.P. test, which contains eighty items. Scores from both exams were converted to a one hundred base.

MEANS AND STANDARD DEVIATIONS - WHOLE SCHOOL

Variable Number	Mean	Standard Deviation	Number of Students
01	9.09*	2.52 *	994
02	9.19*	2.35 *	986
03	8.80*	2.94 *	988
04	9.07	1.48	1096
05	5.78	4.08	1093
06	2.41	2.74	1093
07	16.03	6.73	1080
08	10.40	2.96	1092
09	17.25	2.99	1095
10	34.03	7.01	1089
11	10.76	4.96	1083
12	10.66	2.55	1076
13	3.72	1.52	1076
14	24.26	5.44	1071
15	5.42	1.73	1066
16	2.27	1.02	1066
17	7.69	2.43	1066
18	5.88	4.39	1068
19	6.11	3.01	1068
20	164.66	30.21	1055
21	5.14	1.74	1030
22	53.82 **	22.86	870

*Grade level scores

**It should be noted that Means and Standard Deviations for Math Scores refer only to the number of students indicated in the particular analysis. A number of superior 8th grade students are not required to take the Math Fundamentals Exam. Math scores were included in this analysis so that correlations of math and grammar skills

TABLE III

Means and Standard Deviations - 7th Grade

VARIABLE	MEAN	STANDARD DEVIATION	NUMBER OF STUDENTS
1	78.2064	25.2629	344
2	79.5357	22.2702	336
3	73.3065	28.5762	336
4	8.5836	1.7431	354
5	4.7790	3.0051	353
6	1.8512	2.1744	353
7	14.7543	6.6955	346
8	10.0767	3.2250	352
9	15.4944	3.6544	356
10	31.6409	9.6752	352
11	10.2365	4.6320	351
12	10.4669	2.4697	347
13	3.6916	1.5319	347
14	23.4052	5.2823	343
15	5.6068	1.7739	342
16	2.1140	1.6503	342
17	7.1225	2.4452	342
18	6.1963	3.7953	342
19	5.6304	2.9344	342
20	154.5629	29.1897	334
21	5.3703	1.5615	316
22	41.3067	21.6225	313

TABLE IV

MEANS AND STANDARD DEVIATIONS - 8th GRADE

VARIABLE	MEAN	STANDARD DEVIATION	NUMBER OF STUDENTS
1	32.5099	23.0358	355
2	33.4930	22.0924	355
3	30.1152	27.3961	356
4	9.1189	1.4311	387
5	5.7202	2.8928	386
6	2.2388	2.6392	386
7	15.5995	6.5025	387
8	10.2771	2.9852	387
9	17.4470	2.7060	387
10	34.4785	5.3689	387
11	10.6010	3.8915	386
12	10.7150	2.6150	386
13	3.7927	1.5301	386
14	24.1684	5.3204	386
15	5.3420	1.7622	386
16	2.2150	1.0533	386
17	7.5595	2.4459	386
18	6.2332	4.5519	386
19	6.0285	3.1037	386
20	156.2296	32.0788	383
21	5.0505	1.5979	361
22	56.2135	22.0855	281

TABLE V

MEANS AND STANDARD DEVIATIONS - 9th Grade

VARIABLE	MEAN	STANDARD DEVIATION	NUMBER OF STUDENTS
1	103.7898	20.2015	295
2	104.3326	19.2647	295
3	102.1858	24.6831	296
4	9.4197	1.1205	355
5	6.8559	5.5009	354
6	3.1723	3.1643	354
7	17.8127	6.6673	347
8	10.8569	2.6115	353
9	17.8097	2.3487	352
10	35.7629	4.3839	350
11	11.4942	6.1395	346
12	10.3076	2.5795	343
13	3.6939	1.5207	343
14	25.2465	5.5974	342
15	5.9438	1.5215	338
16	2.4941	.9183	338
17	6.4379	2.2082	338
18	5.1824	4.6919	340
19	6.4971	2.9524	340
20	172.8817	25.9962	333
21	4.9972	1.9893	353
22	53.5543	17.9474	276

October of the academic school year is not a typical, average, contemporary junior high school. The Elwood student population is made up of primarily middle and upper middle class families. Perhaps in the future when utilizing standardized tests, norms for this particular population should also be considered along with the published norms.

2. If the State and the faculty deem the ability to recognize the subject and verb of a sentence as a prerequisite skill for completion of junior high school, more attention will have to be given to these items in the Language Arts classes in the future.

3. There are graduated increases in the mean scores of all variables except number 21, first quarter Language Arts grade. While we remain assured that many of the 9th graders are at exactly the same skills level as many 7th graders, and vice-versa, the Language Arts faculty as a whole may have some feeling of assurance that something, though we are not certain what, is occurring during the three years that our students are with us in the junior high.

Correlation Matrices

Correlation matrices were obtained for all of the twenty-two variables by grade levels 7, 8, and 9. As there is not wide disparity among the sets of correlations, it is felt that it is not necessary to include the results by grade level.

Some of the more interesting correlations that were noted are:

1. Variable No. 1, Total Reading Score, as expected, correlates with the other subtests of the CAT, vocabulary and comprehension, Variables No. 2 and 3, with the total raw score of the Language Arts Diagnostic Examination, Variable 20, and with the Math Score, Variable 22. As always,

reading ability is helpful for success in school.

2. Variables 5 and 6, Subject and Verb Recognition, Variable 13, Possessive Nouns, and Variable 18, Antecedents, correlate low with other subsections. This would be an area for further study. Does this usually happen on standardized grammar tests? If so, why? If not, is there something peculiar to this test that causes this to happen. Or, is this merely indicative of the fact that different skills are being tested?

3. Variable 21, first quarter Language Arts grade, does not correlate as highly as might be expected with reading scores and other skill subsections of the Language Arts Diagnostic Examination.

Frequency Distributions

Frequency distributions were calculated for each variable by whole school and grade level. In all, 88 distributions were calculated.

Needless to say, it is somewhat of a shock to see that despite good school-wide reading scores, 104 out of 355 8th grade students were tested as reading below grade level at the beginning of academic year, 1972-73.

The Math Department of Elwood Junior High has prepared cumulative percentages for each of the 22 variables by whole school and grade level. This is the aspect of the analysis that we plan to make the most use of in an experimental, individualized program going into effect next year. At the beginning of the year we plan to test a student in a specific skill area, and to inform him or her (and to record) the percentile scored. At a later date posttesting will be done.

We plan to be able to indicate that in an October testing a 7th grade student scored at the 40th percentile of the 7th grade in Punctuation skill,

(35th percentile, whole school). Hopefully, by April, we will be able to tell that same student that he or she has now scored at the 70th percentile for the 7th grade (64th percentile, whole school).

It is felt that these school established norms will be most helpful to the teachers in individualizing instruction for students, and in becoming more accountable for student learning.

Analysis of Variance

An analysis of variance for each of the 22 variables, listed in Table I above, was calculated for four groups:

1. Students who attended Cuba Hill Elementary School
2. Students who attended Harley Avenue Elementary School
3. Students who attended Manor Plains Elementary School
4. Students who attended elementary school outside of the district.

It was readily apparent from this analysis that the fourth group, children who attended school outside of the district, do significantly better in almost every category. It is not perceived that this should be looked at in a negative light as concerns the Elwood School District. As explained in the introduction, Elwood is becoming an increasingly more affluent suburban community. Whereas perhaps some five years ago, a home in the \$20,000 to \$30,000 price range was not unusual, it is now difficult to purchase a home in the Elwood area for less than \$60,000 to \$70,000.

Many of the newer students in Elwood have more than one residence; e.g., a ski house in Vermont, and have travelled extensively. It is believed that the differences in achievement are more reflective of socio-economic life style than classroom experience. Obviously, however, this is an area for further study and investigation.

It should also be noted that a further analysis of variance was run eliminating the fourth group, children who attended elementary school outside of the district. It was believed that perhaps because of differences in organizational patterns within the three elementary schools (Harley Avenue, for example, has a more traditional approach, while Manor Plains is an "open classroom" or "complex" school) and because of seemingly dissimilar socio-economic groupings around the three elementary schools, differences might be found among them.

The following items were significant at the .05 level when the analysis of variance was run for three groups.

Variable Number	Item
5	Sentence Recognition
6	Predicate Recognition
10	Verb Tense Usage
13	Possessive Noun Usage
18	Antecedents
20	Total Raw Score, Language Arts Diagnostic Exam.
22	Math Score

A further analysis of variance is in the process of being run. This one will be broken down into nine groups, the three elementary schools by three grade levels, e.g., 7th graders who attended Cuba Hill, Manor Plains, and the Harley Avenue School. When this is completed, a report indicating the areas of significant difference and the particular schools accounting for the source of the variation encountered in this practice research exercise will be prepared and forwarded to those concerned.

Class Profiles

A further analysis of the data was performed in which sorting was done by period of the day and by teacher. This provided each classroom teacher with

the mean scores and standard deviations for each of the twenty-two variables for each of his or her classes.

Teachers reported this information to be very helpful in planning for particular classes.

ELMOOD JUNIOR HIGH SCHOOLENGLISH DEPARTMENTDIAGNOSTIC SKILLS EXAMINATIONGRADES 7, 8, 9

1. Recognizing Sentences - On the line before each group of words write S if the group is one complete sentence, R if the group is two sentences written as one, or F if the group is not a complete sentence.

Example: F If I fly to San Francisco the week after next.

- _____ 1. Have you ever visited in a foreign country?
- _____ 2. Reading about the experiences of the pioneer spacemen.
- _____ 3. Give your suggestions to the chairman of the committee.
- _____ 4. Laura wrote an interesting story I enjoyed reading it.
- _____ 5. Each member of the club will display his hobby at the meeting.
- _____ 6. After seeing all the new models at the automobile show.
- _____ 7. There are some books on the table is one of them yours?
- _____ 8. Members of our class are writing to children of several foreign countries.
- _____ 9. Understanding among the nations of the world.
- _____ 10. Betty gave the report of the committee at the last meeting weren't you there?

II. Recognizing Sentence Parts

For each sentence write the simple subject on the top line and the simple predicate on the bottom line.

Example: train When will the train

will arrive from Cleveland arrive?

- | | |
|-------------------------------------|-------------------------------------|
| _____ 1. One boy in our class has | 6. _____ That picture was painted |
| _____ his own science laboratory. | _____ by a French artist. |
| _____ 2. Has Harriet finished the | 7. _____ Did she see Frank Martin |
| _____ costumes for the play? | _____ in the hall? |
| _____ 3. In the corner of the cage | 8. _____ Janet has been reading an |
| _____ lay a big lion. | _____ exciting book. |
| _____ 4. Are the boys going with us | 9. _____ That boy in the front seat |
| _____ to the game? | _____ is her brother. |
| _____ 5. My mother visited school | 10. _____ On our way home we saw |
| _____ last week. | _____ two brown thrushes. |

III. Capitalizing and Punctuating Sentences

At the left of each sentence write each word that should be capitalized or followed by a punctuation mark. Include the mark required: comma, period, question mark, exclamation mark. Write the words in order. You will receive one point for each correct capital or mark supplied.

Examples: me. You Write to me you
address. have my address

- | | |
|---|-------------------------------------|
| _____ 1. What famous inventor was _____ | _____ 7. Yes his name is associated |
| _____ born in Milan Ohio _____ | _____ with that city Jean |
| _____ 2. He was born on February _____ | _____ 8. What a wonderful Ameri- |
| _____ 11 1847 _____ | _____ can he was tell me more |
| _____ 3. Miss Brown give me an- _____ | _____ about him |
| _____ other hint _____ | _____ 9. Our teacher said "Read |
| _____ 4. He invented a typewriter _____ | _____ about him yourself" |
| _____ the phonograph and the _____ | _____ 10. "Let's give a program on |
| _____ incandescent lamp _____ | _____ inventions" I said |
| _____ 5. Yes Thomas Edison in- _____ | _____ 11. Will you talk about the |
| _____ vented these he also _____ | _____ telephone the radio or the |
| _____ invented a motion-picture _____ | _____ airplane |
| _____ camera _____ | _____ 12. We'll give our program on |
| _____ 6. Did he have a workshop _____ | _____ February 11 1966 |
| _____ at Menlo Park New Jersey _____ | |

IV. Using Troublesome Verbs - On the lines before the sentences, write in order the correct form of each pair of verbs underlined.

Example: did I did done my chores and
lay then laid lay down.

- | | |
|--|--|
| _____ 1. Jim <u>came</u> <u>come</u> home early and _____ | _____ 6. As I was <u>setting</u> <u>sitting</u> the |
| _____ <u>sat</u> <u>set</u> waiting for us. _____ | _____ I <u>saw</u> <u>seen</u> him go by. |
| _____ 2. When Father <u>saw</u> <u>seen</u> me, he _____ | _____ 7. Has the postman <u>came</u> <u>come</u> ? |
| _____ <u>raised</u> <u>rose</u> to his feet. _____ | _____ I haven't <u>saw</u> <u>seen</u> him. |
| _____ 3. I <u>laid</u> <u>lay</u> on the desk the book _____ | _____ 8. After Sally <u>did</u> <u>done</u> the wo- |
| _____ Bob had <u>gave</u> <u>given</u> me. _____ | _____ she <u>laid</u> <u>lay</u> in the sun. |
| _____ 4. What have you <u>did</u> <u>done</u> with _____ | _____ 9. Hank has <u>did</u> <u>done</u> his work |
| _____ the money she <u>pave</u> <u>give</u> you? _____ | _____ and has <u>gone</u> <u>went</u> home. |
| _____ 5. I'll <u>lay</u> <u>lie</u> down after he has _____ | _____ 10. Sis <u>came</u> <u>come</u> in and <u>sat</u> <u>s</u> |
| _____ gone went. _____ | _____ down a big package. |

DIAGNOSTIC SKILLS EXAMINATION

ENGLISH DEPARTMENT

PAGE THREE

V. USING VERBS - On the lines before the sentences, write in order the correct form of each pair of verbs underlined.

Example: let She will leave let me go
eaten after I've ate eaten.

- | | |
|---|---|
| _____ 1. It <u>doesn't</u> <u>don't</u> seem to have | 14. _____ The 'utro has <u>roke</u> <u>roken</u> . |
| _____ <u>learned</u> <u>taught</u> him anything. | _____ and the trial has <u>egan</u> <u>egun</u> . |
| _____ 2. <u>Can</u> <u>May</u> I go after I have | 15. _____ We had <u>drank</u> <u>drunk</u> the milk |
| _____ <u>written</u> <u>wrote</u> the report? | _____ and had <u>ate</u> <u>eaten</u> the pie |
| _____ 3. You <u>had</u> <u>ought</u> <u>ought</u> to have | 16. _____ The words may be <u>sang</u> <u>sung</u> . |
| _____ <u>chose</u> <u>chosen</u> me. | _____ or they may be <u>sroke</u> <u>sroken</u> . |
| _____ 4. We <u>was</u> <u>were</u> glad that our | 17. _____ Have you <u>threw</u> <u>thrown</u> away |
| _____ parents hadn't <u>left</u> <u>let</u> us go. | _____ the paper I <u>brought</u> <u>brung</u> ? |
| _____ 5. These cars <u>are</u> <u>is</u> the only | 18. _____ You would <u>have</u> <u>of</u> won if |
| _____ ones I've <u>driven</u> <u>drove</u> . | _____ you hadn't <u>fallen</u> <u>fell</u> . |
| _____ 6. I wish I had <u>knowed</u> <u>known</u> | 19. _____ The whistle <u>blew</u> <u>blowed</u> , and |
| _____ that you <u>was</u> <u>were</u> there. | _____ the fight <u>egan</u> <u>egun</u> . |
| _____ 7. <u>Doesn't</u> <u>Don't</u> he know that | 20. _____ He <u>drank</u> <u>drunk</u> the milk and |
| _____ I've <u>growed</u> <u>grown</u> up? | _____ then <u>ran</u> <u>run</u> outside. |
| _____ 8. He had <u>broke</u> <u>broken</u> into the | |
| _____ barn and had <u>stole</u> <u>stolen</u> it. | |
| _____ 9. I would have <u>wore</u> <u>worn</u> the | |
| _____ coat, but it was <u>tore</u> <u>tern</u> . | |
| _____ 10. The bells had <u>rang</u> <u>rung</u> , and | |
| _____ the whistles had <u>blew</u> <u>blown</u> . | |
| _____ 11. <u>Was</u> <u>Were</u> you tired after you | |
| _____ had <u>ran</u> <u>run</u> so far? | |
| _____ 12. He has <u>ridden</u> <u>rode</u> in a jet, | |
| _____ but he hasn't <u>flew</u> <u>flown</u> one. | |
| _____ 13. I had not <u>taken</u> <u>took</u> a coat | |
| _____ and was nearly <u>frose</u> <u>frozen</u> . | |

VI. CAPITALIZING AND PUNCTUATING SENTENCES - On the left of each sentence write each word that should be capitalized or followed by a comma. Write the words in order. Count one point for each correct capital or comma supplied.

Example: Henry henry this is

Mr. Holt or holt my uncle.

- | | |
|--------------------------------------|-------------------------------------|
| _____ 1. Yes father there is an old | _____ 6. This year memorial day and |
| _____ sea an area without a land | _____ the fourth of july will be |
| _____ boundary in one ocean. | _____ on a tuesday. |
| _____ 2. The sargasso sea a region | _____ 7. My father and aunt jo sang |
| _____ in the atlantic ocean is the | _____ "home on the range" a song |
| _____ area sea. | _____ of the west. |
| _____ 3. Bill why don't you ask dr. | _____ 8. This summer mr. hunt will |
| _____ c. c. wells your new science | _____ direct y.m.c.a. activities. |
| _____ teacher about the sea? | _____ 9. In september my sister en- |
| _____ 4. Sargasso the name of the | _____ rolled at mills college in |
| _____ sea means "seaweed" in the | _____ california. |
| _____ portuguese language. | |
| _____ 5. Gulfweed a kind of floating | |
| _____ seaweed covers this sea Bill | |
| _____ about 2000 miles west of | |
| _____ the canary islands. | |

VII. PLURAL AND POSSESSIVE FORMS OF NOUNS - On the lines before each sentence write in order the correct form of each noun underlined.

Example: man's The man's sons

wives wife's wives agreed.

- | | |
|--|--|
| _____ 1. His <u>son-in-law</u> <u>sons-in-law</u> | _____ 6. The <u>farmers</u> <u>farmers'</u> market |
| _____ repair <u>radios</u> <u>radioes</u> . | _____ sells <u>turkeys</u> <u>turkies</u> . |
| _____ 2. The <u>baby's</u> <u>baby's</u> loud <u>cries</u> | _____ 7. We found <u>sheep</u> <u>sheeps</u> on |
| _____ <u>crys</u> alarmed us. | _____ the <u>beaches</u> <u>beachs</u> . |
| _____ 3. The <u>boys</u> <u>boy's</u> fat <u>calfs</u> | _____ 8. The <u>chiefs</u> <u>chieves</u> were men |
| _____ <u>calves</u> sold well. | _____ not <u>mouses</u> <u>mice</u> . |
| _____ 4. The <u>women's</u> <u>womens'</u> job | _____ 9. We read of <u>heros</u> <u>heroes</u> and |
| _____ is peeling <u>potatos</u> <u>potatoes</u> | _____ their <u>ladys</u> <u>ladies</u> . |
| _____ 5. <u>Boy's</u> <u>Boys'</u> books are on | _____ 10. Two <u>spoonfuls</u> <u>spoonsful</u> is |
| _____ these <u>shelvs</u> <u>shelves</u> . | _____ the <u>childrens</u> <u>children's</u> do |

DIAGNOSTIC SKILLS EXAMINATION

ENGLISH DEPARTMENT

PAGE FIVE

VIII. PRONOUN FORMS - On the lines before each sentence write the correct form of each pronoun underlined.

Example: she Did you and she her see

me George and I me?

1. John and he him are going by
themselves themselves.
2. We Us girls will send you and
they them Souvenir post cards.
3. It was she her who told Ann
and I me.
4. They Them are much better
tennis players than we us.
5. The President himself hisself
greeted we us students.
6. Frank and you yourself will
ride with Ann and I me.
7. Father and he him bought we
us members the badges.
8. Was it he him who gave you
and she her the flowers?
9. Certainly we us boys can play
as well as they them.
10. The new class officers are he
him and she her.
11. Sally and she her gave we us
boys some good advice.
12. It was they them who gave Sam
and I me our first chance.
13. The teachers and he him will
help we us students.
14. Your letter gave she her and
I me encouragement.
15. You and I me have more free
time than Hal and he has.

VIII. PRONOUN FORMS (CONT'D.)

- _____ 16. He Him and I me will gladly
 _____ help you two.
- _____ 17. It was they them who rescued
 _____ Bill and he him.
- _____ 18. Mr. Hinkle interviewed he him
 _____ and I me on the TV program.
- _____ 19. Jane and I me will lend you
 _____ and she her our bicycles.
- _____ 20. It is we us girls who should
 _____ thank you and he him.

IX. POSSESSIVES AND CONTRACTIONS - On the lines before each sentence write the correct form of each pronoun underlined.

Example: hers Is this coat hers her's
yours or your's yours?

- _____ 1. This pencil is his his's, but
 _____ whose who's pencil is that?
- _____ 2. Its It's time for that tree to
 _____ shed its it's leaves.
- _____ 3. Their They're work is harder
 _____ than your you're work.
- _____ 4. Who's Whose going to waken
 _____ us when it's its time?
- _____ 5. If the car isn't theirs their's
 _____ who's whose is it?

DIAGNOSTIC SKILLS EXAMINATION

ENGLISH DEPARTMENT

PAGE SEVEN

X AGREEMENT OF PRONOUNS WITH ANTECEDENTS - On the first line write the antecedent of the pronoun underlined which agrees with this antecedent.

Example: Everybody Everybody enjoyed
 himself themselves himself.

- _____ 1. Every member should give this
 his their careful attention.
- _____ 2. Each of the guests will help
 himself themselves.
- _____ 3. Nobody reported that they he
 had lost anything.
- _____ 4. Someone has failed to do his
 their duty.
- _____ 5. If anyone has more information,
 he they should tell us.
- _____ 6. Either Jill or Ann has left her
 their sweater.
- _____ 7. Each girl provides their her
 own costume.
- _____ 8. Neither Al nor Bill has handed
 in his their paper.
- _____ 9. Surely everyone will do their
 his best work.
- _____ 10. One of the passengers has lost
 his their ticket.
- _____ 11. She and Sis have their her own
 room.
- _____ 12. Which student didn't put his
 their name on the list?

(This study is summarized above as Report No. 2.)

BILINGUAL-BICULTURAL PROGRAMS
District 24 Queens

Submitted to:
Model Educational Research
Training Program
School of Education
New York University

BILINGUAL-BICULTURAL PROGRAMS

PROGRAM OBJECTIVES

The Bilingual-Bicultural Program in District 24 had the following major objectives:

1. To equip children with basic concepts and native language skills necessary for the beginning of reading instruction in Spanish and English.
2. To enable children to become functional bilinguals through the development of strong literary and oral skills in English and Spanish.
3. To initiate opportunities for both English dominant and Spanish dominant children to experience and share their own and each other's culture via music, songs, holidays, food, and dance.

EVALUATION OBJECTIVES:

The evaluation of the Bilingual-Bicultural Program was designed to assess the degree to which program objectives were achieved. The evaluation objectives were:

1. Given the Boehm Test of Basic Concepts in either Spanish or English on a pre-post program basis, participants will improve significantly in their ability to understand concepts basic to performance in a regular academic program.
2. Given the New York City Prereading Assessment on a pre-post program basis in English or Spanish, program participants will improve significantly in their performance on native language skills basic to prereading and beginning reading instruction.
3. Given the Linguistic Capacity Index to Spanish speaking children and the Test of Basic Experience-Language to English speaking children on a pre-post program basis, Spanish speaking children will show significant gains in oral and receptive English while English native speaking children

will show significant gains in their ability to speak and understand Spanish.

METHODS OF DATA COLLECTION

Various methods for collecting pertinent data from the target schools were used. The most important means of data collection were pre-post testing, interviews, and classroom observation.

Testing. The testing phase of the evaluation provided objective data, the basis used to determine whether or not the objectives of the program were achieved. The testing instruments used were:

1. The Boehm Test of Basic Concepts-available in Spanish and English.
2. The New York City Prereading Assessment-available in Spanish and English.
3. The Linguistic Capacity Index-available in English.
4. The Test of Basic Experience-Language-available in Spanish and English.

The pretests were administered to all children in the bilingual program during October, November and December. The posttests were administered in May.

Based on the assumption that children would do better when tested in their native language, it was important to delineate the procedure used and what groups were tested in what language. The Spanish dominant children were given the Spanish version of the Boehm Test of Basic Concepts and the New York City Prereading Assessment while the English dominant children were given the English version of the same tests.

One of the objectives of the program was to enable children to become functional bilinguals. In order to assess this objective, the Spanish dominant student was given the Linguistic Capacity Index and the English dominant student was given the Test of Basic Experience-Language in Spanish.

In general, the pre-post testing procedure provided hard data which was used to assess the effects of the program on students' achievement in basic concepts, reading, and language skills.

Interviews and Observation. In terms of evaluating the program the interviews and observations were made by a member of the evaluation team. The interviews provided the principal and the bilingual staff an opportunity to discuss and share their perceptions on how the program was being implemented. The classroom observation gave the evaluator an opportunity to see the program in operation. The frequency of school visits permitted the evaluator to receive an overview of program implementation and the problems that were encountered in each school.

DESCRIPTION OF PROGRAM IN OPERATION

Program Implementation. During the summer of 1972, the Bilingual-Bicultural Program was designed; a Bilingual-Bicultural Director was hired; an inservice training seminar was planned and implemented at the beginning of September; and the materials and supplies needed to execute the program were studied, evaluated, and purchased.

The Bilingual-Bicultural Program was implemented in three schools in District 24 Queens, namely, P.S. 13, P.S. 89, and P.S. 143 in September of 1972. Each school initiated the Bilingual-Bicultural Program in kindergarten and first grade.

Organization of Program. The Bilingual-Bicultural Program was designed to teach mathematics, reading, and language by the use of English and Spanish as the media of instruction. In other words, the students were to receive instruction in English half of the time and in Spanish the other half of the time. In order to accomplish this objective a bilingual teacher, a bilingual professional assistant, and a bilingual educational assistant were hired for each bilingual class.

Each bilingual class was divided into three subgroups according to the level of English and Spanish proficiency. The teacher and the assistants alternated from one group to the other thus permitting the three adults

to interact with all the children in a small group and providing the students with experiences of three teaching styles.

The bilingual classes were conducted daily, Monday through Friday, during the entire school year of September through June. The daily horarium was from 9:00 a.m. to 12:00 noon and 1:00 p.m. to 3:00 p.m. except for the kindergarten class. The kindergarten class began with the morning session at 9:00 and terminated at noon whereas the afternoon session was from 1:00 to 3:00 p.m.

1. Selection

For the most part children were selected on the basis of parents wanting their child to participate in a bilingual-bicultural program where Spanish dominant children and English dominant children would be integrated. Parents requested the principals to put their child in the program. However, not all students were accepted. This was due primarily to the program design which delineated the number of students each grade was to service. There was little deviation from this number. However, during the course of the year there were transfers from other schools into the program. If the student had limited English proficiency at the time of the transfer the principals would assign the student to the bilingual class. The mobility of student population in and out of the program was more or less equal. The transfers in and out of the program were due chiefly to parents moving in or out of a school attendance area.

There were 40 participants in kindergarten, 20 in the morning session and 20 in the afternoon session, and 30 in the first grade in each of the three schools of which there were approximately half and half native English speakers and native Spanish speakers. A total of 210 students participated in the program, 120 in kindergarten and 90 in first grade.

2. Staff

During the first year of operation the selection of the bilingual staff was made by the principals of the schools. In a few cases the Anglo-teacher was not functionally bilingual which was an obstacle to the effective and efficient operation of the Bilingual-Bicultural Program. However, as the year progressed and more money was made available through special tax levy funds for additional paraprofessional help, the bilingual director was given some influence in selecting and nominating bilingual educational assistants to the schools.

Staff selection in 1973-74 school year will be on the basis of a new set of criteria which was completed through the efforts of the Bilingual Director, The Director of State and Federal Programs, and other staff members of the District Office. The new criteria are especially relevant for the new positions that are opening because of program expansion and for job vacancies. The initial screening of candidates will be accomplished through the District Office and the Bilingual Office in the district. Since the program is designed to teach the children in both languages, it is of utmost importance that the staff be functionally bilingual.

Staff development was an important, integral part of the Bilingual Program in District 24. It is believed that the success of the bilingual-bicultural program is dependent upon the degree of skills possessed by the bilingual teachers. The director conducted an intensive pre-in-service seminar as well as a monthly on-going in-service training for bilingual teachers and paraprofessionals. At these meetings the staff received special training in the philosophy and methodology of bilingual and bicultural education. Through the use of Title VII funds the bilingual staff was encouraged to further their professional growth by enrolling in graduate courses in theory and practice at Hunter College and the City University of New York. Funds provided by the

United Federation of Teachers provided the same opportunity for professional growth of educational assistants.

3. Curriculum

The three participating schools in the Bilingual-Bicultural Program adopted the Distar instructional program in reading, language, and arithmetic when the medium of instruction was English. The Distar program is a highly structured, systematic, sequential and individualized approach to learning. This program stressed basic language skills, beginning reading skills, and the learning of basic concepts. The Distar approach required special training for the teachers and the bilingual educational assistants. The training was provided by Distar consultants from Science Research Associates, (S.R.A.). The Distar program was conducted according to the specification of the program. Three adults, the bilingual teacher, the bilingual professional assistant, and bilingual educational assistant were in the classroom, each working with a group of 7 to 10 children.

The Redondel instructional program was adopted as the program to follow when Spanish was the medium of instruction. Based on classroom observation there was virtually little Spanish instruction in the bilingual classroom. Spanish was used for cultural activities such as learning songs, names of foods, days of the week, numbers, and other little Spanish phrases. Other than that there seemed to be little systematic, small group development of the Spanish language.

It is difficult to discern the real reason for the cause of Redondel's unsatisfactoriness as an instructional approach in Spanish. The question is, was it unsatisfactory because of its organization and "foreign" linguistic style for Spanish speakers in New York City or because it was compared with the Distar program which was highly structured, systematic and sequential? The question remained unanswered. In any event, the director of bilingual

programs, the bilingual staff, and other bilingual consultants all concurred that the Redondel program as a program for developing the Spanish language and Spanish reading skills was unsatisfactory.

Theoretically, the program was designed to teach language, reading, and mathematical concepts by the use of English and Spanish as the media of instruction. Students were to receive instruction in English half of the time and Spanish the other half of the time. However, this was not feasible in terms of the amount of time available to the teachers in teaching these subject areas in both languages. Consequently, more time and emphasis was placed on the Distar curriculum than on the Redondel program of instruction. The bilingual director and bilingual teachers indicated several reasons for the emphasis of English as the medium of instruction. They were:

1. Lack of time for both Spanish and English programs.
 2. English was a higher priority because of its objective of enhancing communication and competency in the ability to speak English. Implicit in the program objectives was the reduction and minimization of the communication and language barrier.
 3. The organization and structure of Distar was preferred over the Redondel program which lacked rigid structure.
 4. The need for a planned program to lend some stability to the new experimental program of bilingual education in District 24.
4. Physical Facilities and Materials

There was no actual rating of the physical facilities of the bilingual classrooms but cognizance of the conditions of the physical facilities was taken. Two schools, P.S. 89 and P.S. 143 were in the process of renovating the school and building mini-schools in which the kindergarten classes were located in January 1973. The classroom sizes of the three schools and mini-schools were adequate and there was space available for small group work and for some individual work. The teachers were ingenious in the ways they partitioned off areas for small group work. Lighting, ventilation, and adequate toilet facilities were above average in the schools.

The classrooms were especially attractive in terms of the teachers exhibiting the work of their students. The children manifested a joy and were particularly proud of their little contributions. The chalkboards were more often utilized as bulletin boards than as a visual and useful tool in teaching and learning. Several classrooms have a need for more chalkboard space.

The schools had the necessary materials and supplies for the efficient execution of the Distar and Redondel programs. However, there was not much variety of materials being used because all available time was used to accomplish the goals of Distar and Redondel. This is not a criticism of the teachers' competence but the Distar program does have its own constraints on the system.

5. Integration of Bilingual Teachers with Other School Personnel

Bilingual teachers and educational assistants were reasonably well integrated into the regular school program. Most teachers were an integral part of the school system prior to working in bilingual programs. They were not isolated from the other teachers. However, because of the tight schedule bilingual teachers and paraprofessionals did not have much opportunity to interact and communicate with other teachers.

Children in the bilingual program did participate in the activities of the school. They went to assembly meetings, saw movies, participated in school programs, and had access to the facilities and materials like all children in the regular program. In a certain sense, the children had more opportunities to participate in learning activities and other activities than the children of the regular program. This was due to the bilingual-bicultural design which included celebration of the two cultures.

In all three schools there was a high level of cooperation by the principal with the teachers, the bilingual director, and bilingual evaluator.

Communication was open among the principals, teachers, and director of bilingual programs. There were numerous occasions for individualized teacher assistance and for immediate feedback with the director which facilitated problem-solving as problems were encountered.

The Bilingual-Bicultural Program was designed in such a way as to permit and encourage peer interaction among Spanish dominant children and English dominant children. Spanish dominant children and English dominant children played, talked, interacted, and studied among themselves. Another important asset of the program was the provision of a model for speaking the second language. The Spanish dominant child provided a model for the English dominant child to speak Spanish and the English dominant child provided a model for the Spanish dominant child to speak English.

6. Parental Involvement

The designers of the Bilingual-Bicultural Program in District 24, Queens, realized the importance of parental involvement in the program. They believed that if the impact of bilingual-bicultural program is to be maximal, the expectation of the school must be congruent with the expectation of the local community. Parents of the participating children, as well as other members of the community were involved in the planning and operation of the program.

Parents participated in workshops and meetings and some were members of the school's Bilingual Advisory Committee. The purpose of the Bilingual Advisory Committee was to develop in depth community knowledge and support of the program. Parents contributed to the general positive overtones of the program by working with teachers in planning holiday celebrations, by attending parent-teacher conference, and by their willingness to contribute time and energy in order to develop a better understanding of the bilingual-bicultural educational program in the community.

Although it was not always true, by February 1973 the participating schools had a Bilingual Teacher in School and Community Relations who served as a liaison between school and community. This position served as a bridge for Non-English speaking parents to have some contact with the school. It also facilitated and encouraged parental communication with the school and it provided an opportunity other than parent-teacher meetings to discuss, school policies, programs, and activities with a person who understood his language and culture.

EFFECTS OF PROGRAM ON CHILDREN

Before delineating the results of the program or its effects on children, it is necessary to be aware of some of the factors that have affected the validity of the study. The presence of these factors had reduced the validity of the study and consequently it affected the generalizability of the study. Some of these factors are delineated below:

1. The monolingual group, the control group, was not identical with the bilingual group. The bilingual group, English and Spanish, were selected into the program on the basis of the predisposition of parents to have their children in the program. The monolingual groups were intact groups and there were few native Spanish speakers in these classes. Although comparison were made between the two groups, it must be realized that the conclusions are tenuous.

2. The groups were not matched on variables that do have an effect on academic achievement. Such variables are: socio-economic status, intellectual ability, race, academic achievement, etc.

3. The experiences that were provided for the bilingual group were not similar in terms of receiving instruction in the native language and the second language. As noted earlier the native Spanish speakers did not receive the same proportion and same systematic instruction in their native language as the native English speakers. The native Spanish speakers received equal treatment in learning concepts, reading and language skills as developed by Distar; however, they were learning these concepts and skills in the second language and not in their native language. At the time of posttesting the Spanish dominant group were tested in their native language after receiving systematic and sequential instruction in the second language. This had put the Spanish dominant group at a disadvantage when compared with the English dominant group on the assessment of achievement in

understanding concepts, and acquisition of reading and language skills in their native language. The Spanish dominant group was instructed in the second language and responded to the tests in their native language. On the other hand, the English group was instructed in their native language and responded to the tests in their native language. In terms of the Spanish dominant children the posttest measures assessed more the understanding of the second language than what was learned in the native language. Perhaps the Spanish dominant group would have achieved as well as the English dominant group or better if they were instructed in their native language.

Even though comparisons of the English dominant and Spanish dominant children in the bilingual and monolingual programs were made, care should be taken not to make generalizations beyond this particular group. Comparisons of groups must be on the same basis of similar treatment in their native language and this was not present.

Two statistical procedures were used to analyze the pretest and posttest data, namely, the correlated t-test and the analysis of covariance. Each program objective was analyzed according to:

1. Significant gains made by bilingual and monolingual Ss.
2. Comparison of English dominant Ss and Spanish dominant Ss in the bilingual program.
3. Comparison of English dominant Ss in the bilingual program and English dominant Ss in monolingual programs.

Because of the small number of Spanish dominant Ss in the monolingual program, a comparison of Spanish dominant Ss in bilingual programs and Spanish dominant Ss in monolingual programs was not possible. The results would be tenuous.

Growth in Understanding Basic Concepts. The first objective stated that given the Boehm Test of Basic Concepts in either Spanish or English on a pre-post program basis, program participants will improve significantly in their ability to understand concepts basic to success in a regular academic program. Table 1 indicates the results of the correlated t-tests for all children in the bilingual and monolingual programs for whom complete pre and post data were available.

Table 1 shows that English dominant speakers and Spanish dominant speakers in both bilingual and monolingual programs made significant gains at the .0005 level. It also shows that the actual gains made by Spanish dominant Ss in kindergarten and first grade were larger than those made by English dominant Ss.

In order to determine whether the gains made by the English dominant children were significantly different from those made by Spanish dominant children, an analysis of covariance was performed. The results of that analysis are presented in Table 2.

TABLE 1
COMPARISON OF BILINGUAL CLASSES AND MONOLINGUAL CLASSES
ON THE PRE AND POST TEST GAINS OF THE BOEHM TEST OF BASIC CONCEPTS

		Pretest		Posttest				
	N	Mean	S.D.	Mean	S.D.	Gain	T-Ratio	P.
Kindergarten								
Bilingual								
English D.	49	31.33	7.24	36.92	6.02	5.59	6.205	.0005
Spanish D.	52	24.00	7.90	32.75	7.17	8.75	8.319	.0005
Monolingual								
English D.	44	30.64	9.56	39.34	6.28	8.70	6.175	.0005
Spanish D.	11	13.18	5.70	32.18	9.23	19.00	10.3311	.0005
First Grade								
Bilingual								
English D.	38	35.54	8.63	40.51	5.56	4.97	3.931	.0005
Spanish D.	35	31.05	3.92	36.37	3.04	5.32	8.842	.0005
Monolingual								
English D.	41	35.17	8.94	44.71	4.48	9.54	6.051	.0005
Spanish D.	14	21.14	1.99	37.79	6.99	16.65	11.262	.0005

The data presented on Table 2 show the results of the analysis of covariance for English dominant Ss and Spanish dominant Ss in the bilingual classes. According to these results, it is evident that the English dominant group started out in their achievement of basic concepts at a higher level and also terminated the program with higher scores than the Spanish dominant group. It can, therefore, be concluded that the English dominant Ss did significantly ($p < .05$) better than the Spanish dominant Ss in their achievement of basic concepts.¹ Because of the dissimilarity of treatment in using the native language and second language for English dominant and Spanish dominant Ss, the results are tenuous.

TABLE 2

ANALYSIS OF COVARIANCE ON THE BOEHM TEST OF BASIC CONCEPTS
FOR BILINGUAL ENGLISH DOMINANT AND BILINGUAL SPANISH DOMINANT

	N	Pretest Mean	Actual Posttest Mean	Adjusted Posttest Mean	F-Ratio	p.
Bilingual English D.	87	33.435	38.716	37.338	4.137	.05
Bilingual Spanish D.	87	27.526	34.559	35.553		

Source	SS	DF	MS	F-Ratio
Pretest BTBC	2650.468	1	2650.468	101.018
Grade	50.798	1	50.798	1.947
Group (BIE vs. BIS)	105.998	1	105.998	4.137*
Interaction + Error	4356.064	170	25.624	
Total	7163.328	173		

¹Spanish dominant children showed significantly greater improvement, although the English dominant children's mean performance was higher, in an absolute sense. PM

The results of the analysis of covariance on the Boehm Test of Basic Concepts comparing the English dominant Ss in the bilingual program with the English dominant Ss in the monolingual programs are presented in Table 3. The results show that the null hypothesis, namely, that there is no difference in achievement for children in the bilingual and monolingual programs, was rejected. There is a significant difference between the two programs. Monolingual English Ss achieved significantly higher means than the bilingual English Ss in understanding basic concepts necessary for success in a regular academic program. The results also reject the hypothesis, that on an English criterion test, English dominant children in bilingual programs will do as well as English dominant children in monolingual programs.

TABLE 3
ANALYSIS OF COVARIANCE ON THE BOEHM TEST OF BASIC CONCEPTS
COMPARING BILINGUAL ENGLISH DOMINANT AND MONOLINGUAL ENGLISH DOMINANT

	N	Pretest Mean	Actual Posttest Mean	Adjusted Posttest Mean	F-Ratio	P.
Bilingual English D.	87	33.435	38.716	38.614	17.207	.001
Monolingual English D.	85	32.903	42.024	42.046		

Source	SS	DF	MS	F-Ratio
Pretest BTEC	1024.181	1	1024.181	30.283
Grade	530.597	1	530.597	17.182
Group (BIE vs MOE)	484	1	484.868	17.207
Interaction + Error	4734.013	168	28.179	18.830
Total	6773.63	171		

Growth in Native Language Skills. The second evaluation objective of the bilingual program stated that given the New York City Prereading Assessment - Language on a pre-post program basis, program participants will improve significantly in their achievement on native language skills. Again the correlated t-test and the analysis of covariance were utilized to analyze the pre-post test data and to compare bilingual English and Spanish Ss and to compare bilingual English dominant Ss and monolingual English Ss.

Pre to post test comparisons are presented in Table 4. The results in Table 4 give evidence to the fact that the gain in language skills was significant at the .0005 level for kindergarten children in both bilingual and monolingual programs. The first graders in bilingual and monolingual programs did make significant gains ($p < .025$ and $P < .005$). Thus, the objective to increase native language skills of students in the program was achieved.

In order to determine if the English dominant Ss and Spanish dominant Ss in bilingual classes differed significantly in their growth in native language skills during the program, an analysis of covariance was performed. The results of that analysis are presented in Table 5.

TABLE 4

COMPARISON OF BILINGUAL CLASSES AND MONOLINGUAL CLASSES
ON THE PRE AND POST TEST GAINS ON THE NEW YORK CITY PREREADING
ASSESSMENT LANGUAGE

	N	Pretest		Posttest		Gain	T-Ratio	P.
		Mean	S.D.	Mean	S.D.			
Kindergarten								
Bilingual								
English D.	49	23.45	5.55	27.90	3.99	4.45	6.291	.0005
Spanish D.	52	19.21	5.98	25.88	5.17	6.67	8.227	.0005
Monolingual								
English D.	44	25.05	6.22	29.88	2.05	4.83	5.924	.0005
Spanish D.	11	14.55	8.65	23.55	6.25	9.00	6.453	.0005
First Grade								
Bilingual								
English D.	38	29.34	2.83	30.34	2.28	1.00	2.123	.025
Spanish D.	35	23.77	5.08	27.49	4.38	3.72	8.843	.0005
Monolingual								
English D.	41	29.51	2.84	30.72	2.17	1.21	2.380	.025
Spanish D.	13	25.77	3.00	28.54	2.40	2.77	3.640	.005

The data presented in Table 5 show the results of the analysis of covariance on the New York City Prereading Assessment- Language subtest. Table 5 indicates that there was no significant difference in the mean achieved by the bilingual English dominant Ss and bilingual Spanish dominant Ss. In terms of actual gains the bilingual Spanish dominant children made a greater gain. However, when the program terminated and posttest scores were adjusted the difference in means was not significant between the two groups.

TABLE 5

ANALYSIS OF COVARIANCE ON THE NEW YORK CITY PREREADING
ASSESSMENT - LANGUAGE COMPARING BILINGUAL ENGLISH DOMINANT AND
BILINGUAL SPANISH DOMINANT

	N	Pretest Mean	Actual Posttest Mean	Adjusted Posttest Mean	F-Ratio	P.
Bilingual English D.	87	26.395	29.120	28.303	2.313	N.S.
Bilingual Spanish D.	87	21.492	26.683	27.076		

Source	SS	DF	MS	F-Ratio
Pretest (NYCPA-L)	759.917	1	759.917	49.346
Grade	4.611	1	4.611	0.298
Group (BIE vs BIS)	35.491	1	35.491	2.313
Interaction + Error	2608.662	170	15.345	0.300
Total	3408.681	173		

In Table 6 the results of the analysis of covariance on the New York City Prereading Assessment - Language comparing the bilingual English dominant Ss and the monolingual English Ss are presented. The monolingual English dominant Ss performed significantly ($P < .05$) better than the bilingual English dominant Ss. According to this analysis the hypothesis of bilingual English dominant Ss doing as well as English dominant Ss in monolingual programs was rejected at the .05 level. The two groups began with fairly similar pretest means but after adjustments were made on the actual posttest scores, the monolingual English dominant Ss did significantly better in achievement of language skills.

TABLE 6

ANALYSIS OF COVARIANCE ON THE NEW YORK CITY PREREADING
ASSESSMENT - LANGUAGE COMPARING BILINGUAL ENGLISH DOMINANT AND
MONOLINGUAL ENGLISH DOMINANT

	N	Pretest Mean	Actual Posttest Mean	Adjusted Posttest Mean	F-Ratio	P.
Bilingual English D.	87	26.395	29.120	29.175	6.458	.05
Monolingual English D.	85	27.279	30.296	30.121		

Source	SS	DF	MS	F-Ratio
Pretest (NYCPA-L)	401.620	1	401.620	59.883
Grade	2.719	1	2.719	0.404
Group (BIE vs MOE)	42.141	1	42.141	6.458
Interaction + Error	1096.239	168	6.525	0.417
Total	1542.719	171		

TABLE 7

COMPARISON OF BILINGUAL CLASSES AND MONOLINGUAL CLASSES
ON THE PRE AND POST TEST GAINS ON THE NEW YORK CITY PREREADING
ASSESSMENT - VISUAL DISCRIMINATION

		Pretest		Posttest				
	N	Mean	S.D.	Mean	S.D.	Gain	T-Ratio	P.
Kindergarten								
Bilingual								
English D.	49	14.53	6.62	21.10	4.55	6.57	8.700	.0005
Spanish D.	52	13.50	6.87	21.79	4.49	8.29	9.746	.0005
Monolingual								
English D.	44	12.10	6.79	22.15	4.00	10.05	9.905	.0005
Spanish D.	11	8.46	7.69	18.91	7.05	10.45	4.939	.0005
First Grade								
Bilingual								
English D.	38	22.71	4.03	26.24	1.84	3.53	6.265	.0005
Spanish D.	35	21.06	6.35	25.40	2.55	4.34	4.743	.0005
Monolingual								
English D.	41	23.03	5.01	27.16	1.98	4.13	5.786	.0005
Spanish D.	13	21.62	5.66	25.46	1.82	3.84	2.873	.005

Growth in Visual Discrimination. The growth in visual discrimination was assessed by the New York City Prereading Assessment - Visual Discrimination, subtest. The pre to post test gains made by the English dominant and Spanish dominant children in bilingual and monolingual programs were assessed. The means, gains, and t- ratios are presented in Table 7.

The comparison of the pre and post test data indicate that both bilingual and monolingual English dominant Ss and Spanish dominant Ss in kindergarten and first grade made significant gains at the .0005 level.

In order to determine whether the groups, bilingual English dominant Ss and bilingual Spanish dominant Ss, differed significantly in the gains made in visual discrimination, an analysis of covariance was performed. The results of that analysis are presented in Table 8 A. There was no significant differences in gains made by either group.

TABLE 8 A

ANALYSIS OF COVARIANCE ON THE NEW YORK CITY PREREADING
ASSESSMENT - VISUAL DISCRIMINATION COMPARING BILINGUAL ENGLISH
DOMINANT AND BILINGUAL SPANISH DOMINANT

	N	Pretest Mean	Actual Posttest Mean	Adjusted Posttest Mean	F-Ratio	p.
Bilingual English D.	87	17.621	23.669	23.683	0.1914	N.S.
Bilingual Spanish D.	87	17.278	23.589	23.602		

In Table 8 the results of the analysis of covariance comparing bilingual and monolingual English Ss are presented. It indicates the results of that analysis. There were significant ($P < .01$) differences in the gains made by monolingual English Ss. The monolingual English dominant Ss achieved significantly higher means than the bilingual English dominant Ss.

TABLE 8

ANALYSIS OF COVARIANCE ON THE NEW YORK CITY PREREADING
ASSESSMENT - VISUAL DISCRIMINATION COMPARING BILINGUAL ENGLISH
DOMINANT AND MONOLINGUAL ENGLISH DOMINANT

	N	Pretest Mean	Actual Posttest Mean	Adjusted Posttest Mean	F-Ratio	P.
Bilingual English D.	87	17.621	23.669	23.435	7.759	.01
Monolingual English D.	85	17.563	24.654	24.701		

Source	SS	DF	MS	F-Ratio
Pretest (NYCPA-Vis, Dis.)	1311.318	1	1311.318	122.835
Grade	186.635	1	186.635	19.372
Group (BiE Vs BIS)	71.876	1	71.876	7.759
Interaction + Error	1556.310	168	9.264	20.145
Total	3126.139			

Growth in Receptive and Oral English. Objective three indicated that given the Linguistic Capacity Index on a pre-post program basis, native Spanish speakers will show significant gains in their ability to speak and understand English. The correlated t-test was the only statistical procedure utilized to analyze the results of the above measurement. An analysis of covariance comparing bilingual Spanish children in their ability to understand and hear English with English children in their ability to understand and hear Spanish was not possible because of the limited number of English dominant Ss who completed the pre and post tests of Test of Basic Experience -Language. Table 9 and 10 summarizes the results of the Linguistic Capacity Index of kindergarten and first grade. Bilingual Spanish dominant Ss in kindergarten and first grade made significant gains on all subtests. In general their gains were significant at the .005 level.

TABLE 9

TEST OF SIGNIFICANCE FOR NATIVE SPANISH SPEAKERS AT THE
KINDERGARTEN LEVEL ON THE LINGUISTIC CAPACITY INDEX FOR ALL SUBTESTS

	N	Pretest		Posttest		Gain	T-Ratio	P.
		Mean	S.D.	Mean	S.D.			
Vocabulary	24	13.42	2.95	14.63	2.89	1.21	2.7589	.005
Phonics	24	10.38	2.26	11.75	2.71	1.37	2.5242	.01
Grammar	24	13.25	4.07	15.79	3.40	2.54	4.1020	.0005
Total	24	37.38	7.30	42.29	7.58	4.91	5.0179	.0005

TABLE 10

TEST OF SIGNIFICANCE FOR NATIVE SPANISH SPEAKERS AT THE
FIRST GRADE LEVEL ON THE LINGUISTIC SPACITY INDEX FOR ALL SUBTESTS

	N	Pretest		Posttest		Gain	T-Ratio	P.
		Mean	S.D.	Mean	S.D.			
Vocabulary	35	15.32	3.82	17.21	1.98	1.89	2.6325	.01
Phonics	35	11.86	3.53	13.77	2.89	1.91	3.0638	.005
Grammar	35	14.48	3.54	17.29	2.45	2.80	4.8442	.0005
Total	35	41.43	9.09	47.97	6.09	6.54	5.0661	.0005

Growth in Receptive and Oral Spanish. As stated in objective three, native English speakers will show significant gain in their ability to speak and understand Spanish. The Test of Basic Experience - Language was the instrument used to measure the ability of English native speakers to understand and hear Spanish. Since the Test of Basic Experience - Language was inappropriate as a test measure for the majority of English dominant children in the program, there is little data on the achievement of English dominant Ss in hearing and understanding Spanish.

Table 11 shows the results of the data for only those students who took both the pre and post tests. The means, gains, and t- ratios for English dominant children in kindergarten and first grade are presented in Table 11. This table shows that kindergarten English dominant Ss did not make significant gains in their ability to understand Spanish. On the other hand, first grade English dominant Ss made significant ($P < .0005$) gains in understanding Spanish, the second language.

TABLE 11

TEST OF SIGNIFICANCE FOR NATIVE ENGLISH SPEAKERS OF
KINDERGARTEN AND FIRST GRADE ON THE TEST OF BASIC EXPERIENCE-LANGUAGE

	N	Pretest		Posttest		Gain	T- Ratio	P.
		Mean	S.D.	Mean	S.D.			
Kindergarten	29	8.79	3.17	10.00	3.96	1.21	1.5339	N.S.
First Grade	8	13.63	5.40	21.00	3.38	7.37	4.5384	.0005

FINDINGS:

The data presented in this report support the conclusion that the major objectives were achieved. The following findings support that conclusion.

1. Both English dominant and Spanish dominant Ss made significant pre program to post program gains in understanding basic concepts necessary for success in the primary grades.
2. The English dominant Ss made significantly more gains during the program than the Spanish dominant Ss in understanding basic concepts necessary for success in the primary grades.²
3. The monolingual English dominant Ss made significantly higher gains in understanding basic concepts than bilingual English dominant Ss. The hypothesis that bilingual English dominant Ss would do as well as monolingual English dominant Ss was rejected.¹
4. Both English and Spanish dominant Ss in bilingual and monolingual programs made significant pre to post-program gain in native language skills basic to acquiring beginning reading skills.¹
5. There were no differences between the gains made by English dominant and Spanish dominant in native language skills basic to acquiring beginning reading skills.
6. The monolingual English dominant group made significantly more gains during the program than bilingual English dominant Ss in native language skills.
7. Both English and Spanish dominant Ss in bilingual and monolingual programs made significant gains in visual discrimination basic to beginning reading skills.
8. There were no difference between the gains made by bilingual English dominant and bilingual Spanish dominant children in visual discrimination basic to beginning reading skills.

²See Footnote 1 above.

9. The monolingual English dominant Ss made significantly more gains in visual discrimination than bilingual English dominant Ss.

Bilingual

10. Spanish dominant children in kindergarten and first grade made significant gains in their ability to hear and understand spoken English during the program.

11. Bilingual English children in first grade made significant gains in their ability to hear and understand spoken Spanish during the program. The gains made by English dominant kindergarten Ss in hearing and understanding spoken Spanish were not significant.

(This study is summarized above as Report No. 3.)

THE EFFECT OF READING ALOUD A HIERARCHICALLY-
STRUCTURED, SEQUENTIALLY-PLANNED LITERATURE
PROGRAM ON THE ORAL PROFICIENCY DEVELOPMENT,
INTEREST IN READING, AND READING ABILITY OF
DISADVANTAGED, URBAN, FIRST-GRADERS OF VARYING
EXPERIENTIAL BACKGROUNDS

Submitted to:
Model Educational Research
Training Program
School of Education
New York University

Given that oral language proficiency is generally accepted as the linguistic foundation for skill in reading and that the oral language differences of disadvantaged Black and Puerto Rican children pose an impediment in their reading achievement, a number of oral language programs have been instituted in public schools in the disadvantaged areas of our larger cities in the last five years to alleviate the language difference caused by disadvantage. The evidence has been, however, that, while such direct oral language programs broaden vocabulary and comprehension skills, they do little to increase reading interest or reading ability. On the other hand, recent research indicates that young children exposed to literary programs read aloud daily not only broaden their vocabulary and comprehension skills but develop an interest in reading and increase their reading ability. Therefore, the following study was conducted during the academic year, 1972-73, to determine the effect of reading aloud daily a hierarchically-structured, sequentially-planned literature program on the reading interest, reading ability, and reading achievement of disadvantaged, urban first graders of varying experiential backgrounds.

Operational Definitions

For the purposes of this study, the following definitions apply to the terms listed below and used hereinafter:

Hierarchically-structured Literature Program describes the order in which the books were read to the children. They were presented along a hierarchical continuum from those easiest to understand in terms of concepts and literary devices to those of more literary complexity for children at the first-grade level.

Sequentially-Planned Literature Program refers to the presentation of the books so that the various genre of children's literature were presented to the children in an ordered sequence.

Oral Language Proficiency Development defines the broadening of a basic vocabulary for six-year olds not ordinarily covered in basal readers and intensified listening and comprehension skills as a result of exposure to the special Literature Program.

Reading Ability as used herein does not refer to skills in decoding but to increased comprehension resulting from increased oral language development.

Basic Assumptions

The study undertaken and described herein was based on the following assumptions:

1. That the primary impediment to the reading achievement of lower socio-economic disadvantaged urban children is in the level of oral language proficiency development.
2. That the language systems utilized by disadvantaged children can be most pleasureably and most broadly developed in the context of a planned literature program.
3. That, while direct oral language development programs broaden vocabulary, they have little effect on reading ability and reading interest and achievement.
4. That the appreciative listening experiences of a children's Literature Program results in more attentive listening, thus increasing comprehension.

5. That oral language proficiency increases in relation to the quantity and quality of books read.

6. That, because expanding vocabulary knowledge and increasing the level of comprehension is more enjoyable in the context of a Literature Program rather than in direct instruction, the language experience is better assimilated and accommodated into the experiential background of children exposed to a planned Literature Program.

Need for the Study

At the onset of this study, the objections raised to the oral language development programs being utilized in schools in disadvantaged areas were that, because their direct-language approach was out of context, the programs were boring to the children and, in failing to put the broadened vocabulary into context, made the vocabulary gain difficult to assimilate and accommodate into the children's language system and comprehension skills. Thus, it was felt that oral-language development for the disadvantaged should be placed in the context of good Children's Literature.

Further, studies indicated that in elementary schools in disadvantaged areas, teachers above the Kindergarten level refrain from reading aloud to children on the grounds that it takes too much time from the teaching of reading and mathematical skills. In light of the evidence that those children who excel in reading are those to whom books have been read aloud at home prior to and during their school experience, the failure of first-grade teachers of the disadvantaged to read to their pupils becomes fundamental in limiting their reading achievement. The correlation between being exposed to oral reading of children's books and oral language proficiency and reading development is well substantiated. Whether a literature program applied daily in

the school setting could compensate for the absence of such experiences in the early years was an integral question of this study.

Related Research and Literature

A review of the literature reveals confusion and ambiguity concerning what motivates children to read. It is often proposed that teachers' attitudes towards reading are the dominant characteristics determining children's reading interest. In general, such studies refer to teachers' private reading habits; that is, if she reads often she somehow will impart a love of reading to the children. Accepting Bruner's hypothesis that children learn and assimilate the processes to which they are exposed, the investigator proposed that reading interest was directly proportional to the reading experiences to which the children were exposed--that is, the more the children would be read to orally, the more they would be motivated to read.

Recognition of children's literature--not as a supplement to the curriculum but as a necessity for oral language development--has become increasingly the subject of study during the last five years. As Farrell (1966) proposes in his study, "reading literature aloud to students is not only educationally sound, but for many youngsters, necessary." Concurrent with individual theorist's findings that the reading of literature is necessary, especially for bridging the gap in disadvantaged youngsters' language systems and experiences with those of literature, dominant oral-language development programs are beginning to incorporate into their programs the reading of children's literature. For example, the SEL/Project Language of the Southeastern Education Laboratory, Atlanta, Georgia--an eight-year language centered program designed to alleviate the language differences of disadvantaged children between the ages of four and eleven--has found a direct oral-

language approach insufficient in developing listening and comprehension skills and is therefore incorporating Children's Literature into the program in order to develop those skills basic to successful reading achievement.

In 1954 the Commission on the English Curriculum of the National Council of Teachers of English classified listening into four various types, stressing "attentive listening" as that which is needed in situations in which accuracy of comprehension is involved, "appreciative listening" as that involved when the hearer settles down to enjoy a dramatization, a story, or a poem, and "analytical listening" as that which takes place when the listener weighs what is heard against a personal experience or other information he has. The fourth category was "passive listening" involving a deliberate "tuning out" of what is heard. It was proposed that an efficacious children's literature program was the most effective way to develop the first three listening skills listed by the NCTE and the program least likely to produce the last reaction to the listening experience.

The importance of listening skills to reading ability is well documented. The literature is replete with studies relating listening to its effects on reading. Since both are receptive skills concerned with the intake half of the communication process, they are somewhat analogous. A comprehensive study by Duker (1965) summarizes significant research from some two hundred studies dealing with the relationship between listening and reading. He maintained that twenty-three major studies have reported coefficients of correlation between the two skills, most of which show a strong positive relation.

Directing attention to the question "How is listening related to Reading," Duker cited two significant factor-analysis studies: one by

Holmes and Singer (1961) and one by Spearritt (1961), which leave no doubt of the existence of listening competence as a separate and distinct ability which plays a vital role in determining reading success or failure. Devine (1967) reported on reviews by Hollingsworth (1964) and Townsend (1964) which stress the relationship between reading and listening test scores. Later, Hollingsworth (1965) emphasized the need for planning teaching programs which focus on such a relation.

Given these earlier studies, recent theorists, accepting those findings, have studied the effects of an oral-literature program in the classroom and have found significant gains in oral-language progress. Whereas most of the studies at the elementary level deal with the middle grades, Kellog (1967) investigated the difference in the effects on reading and listening of a first-grade structured listening program as compared with an unstructured listening program, both of which utilized literature. Pre and posttest scores in listening and reading were analyzed. The significant differences in achievement in all treatment groups favored the structured listening program. Duker (1965) cited several studies which suggested that listening ability may be a better predictor of reading potential than are intelligence tests.

In studying the necessity of reading aloud to students, Farrell (1966) classified spoken language into categories of reading aloud or "spoken prose," monologue, and real conversation. He maintained that the need for spoken prose is essential for children not utilizing the standard English language systems on the grounds that the intonation patterns of spoken prose are highly standardized while those of conversation are not; that spoken prose is even in tempo while conversation is not; and that the pauses of spoken prose are

closely related to the grammatical structure of the sentences whereas in conversation they are frequently unpredictable. To attune his ear, therefore, Farrell argued, it is necessary for the child speaking non-standard English to hear his teachers read aloud a great deal. Farrell postulated further than reading comprehension for slow-learning children is difficult because the child is missing the audible clues to meaning which they are unable to infer from the print alone.

Such findings are leading to studies in which authors are concluding that vocabulary development must depend not on conversation exercises of oral-language programs but on reading good children's literature aloud. Aaronson (1971) finds that "despite many existing information media, it is necessary to reintroduce students to reading as the major avenue of information." She argues "The students should be carefully introduced to the best stories written today so as to rekindle in them an interest in words and reading."

In light of the importance of children's hearing the written word spoken aloud, the question might be asked whether the cumulative deficit to which Deutsch (1963) addresses himself is due to a process in which the disadvantaged student progresses through primary and secondary school being constantly limited to a progressive dearth of appropriate listening experiences in the classroom. Aaronson has found that words contribute to gaining understanding only in a "meaningful activity, in which motivation improves tremendously." That finding has been supported by all the recent studies involving a literature program on the oral proficiency development of children.

In her Review and Critique of the Research from 1966-72 on Teaching

Literature to Children, B. Cullinan (1972) finds that reading children's literature produces significant gains in children's reading ability. Cullinan cites Cohen's (1966) study of the effect of a special program in literature on the vocabulary and reading achievement of second-grade children which showed that experimental groups gained significantly more than controls on the criterion measures. Further, Cullinan cites Strickland's (1971) study on the effects of a special literature program on linguistically-different black kindergarten children and Cullinan, Jaggar, and Strickland (1972) studies of the same program for kindergarten through grade three. Results of the two studies indicate that the greatest change in language performance occurred at the kindergarten level and that children who were initially non-standard speakers did significantly increase their ability to reproduce standard English structures due to the literature-based oral language program. Cullinan further cites Sirota (1971) as using a pretest-posttest control group design to see if a planned literature program of daily oral reading by the teacher would affect the quality and quantity of voluntary reading of fifth-grade children. She found that the planned program of oral reading did affect the total number of books children read plus the number of books chosen from a selected recommended list. A concomitant increase in reading ability of experimental subjects was observed. Further, Cullinan cites Burgdorf (1966), who found that children who listened to stories read aloud by the teacher showed a superiority in drawing inferences when compared to children who read the stories to themselves. Summarizing the studies of the effect of literature programs on children's reading, composition, and language abilities, Cullinan found that the literature indicates that "a special program in literature using daily oral reading by teachers has a

significant effect on children's reading ability. (Cohen, 1966; Sirota, 1971; Lyons, 1972; Porter, 1969)."

Sample Population

The present study was carried out in three public elementary schools in the South Bronx, New York City. Each school houses grades one through six, has a student enrollment of 1,100, and the average daily attendance is 90%. Though one of the participating schools is only two years old, the other two participating schools are relatively new, being 10 and 9 years old, respectively. All three schools are attractive, modern plants with pleasant atmospheres and excellent facilities. The buildings are in excellent condition, and the curriculum provided includes gym, art, and music, as well as after-school drama and art programs.

All three schools are designated as Special Service Schools; that is, the pupil population is considered both economically and academically disadvantaged--economically as the average family income for a family of five is less than \$4,000 and academically as the reading scores indicate that over 50% of the student population of the schools is two years below grade reading level. The schools are also "project" schools, that is, schools whose neighboring environs are projects rather than tenements, and whose parent population, therefore, is socio-economically more advantaged than those of schools in the neighboring disadvantaged environs.

The ethnic composition of the community, reflected in the school population of all three schools, is 60% Puerto Rican and 40% Black. Of the 60% Puerto Rican pupil population, approximately 10% are non-English speaking, while most other children have some command of English, ranging along a spectrum of fluency from A to D on the New York City English Language

Proficiency Scale. The racial breakdown of the community is reflected in the local Community School Board, which is composed of nine members, five of whom are Puerto Rican, and four of whom are Black. The staff of the schools does not reflect the racial and ethnic organization of the community as adequately as the school board does. While each school has a staff of approximately 70 teachers, of this number only 10% are Black and the remaining 90% are white. However, each school employs approximately 30 paraprofessionals, of whom 70% are Black and 30% are Puerto Rican.

Research Design and Methodology

For this study, which was initiated in the second week of October, 1972, three classes of first-grade students were chosen from each of the participating schools. Each class was composed of 30 pupils, totaling 270 subjects in the sample. Each class was serviced by a teacher and a paraprofessional. All the teachers involved in the study were white, ranging in age from 25 to 55 and in experience from 3 to 30 years.

Given that the school district employs tracking (grouping by ability level) in all its schools, the classes were chosen according to their exponents so that the study involved three bright classes, three average or middle ability groups, and three groups of lower ability. Those children considered "bright" are those who have had kindergarten and therein displayed good vocabulary, good reasoning ability, good verbalization, and good conceptual skills. "Average" students were those who also had kindergarten experience, but who displayed less ability in verbalization, reasoning, and conceptualization. The children in the lower exponent groups had no kindergarten experience, are less able to conceptualize, reason, or express thoughts verbally.

To control for second-language barriers which may introduce a bias into the study, non-English speaking Spanish students were not part of the sample population. To eliminate differentiating effects of basal-reading programs in the participating schools, classes using similar basal readers were selected to be part of the sample population.

The program was administered in the following manner: of the three bright classes, one was read to aloud five times a week, one was read aloud to one day a week, and one was not read to. The same treatment was applied to the three classes of the children of average ability, and also to the three groups of children with lower ability and limited experiential background. The purpose of applying the program in this design was to determine the effect of reading aloud to children of one ability in differing amounts, but also in differing amounts to children of differing ability to control for effect across ability levels.

The method of instruction was controlled for constancy across all groups exposed to the treatment. Experimental classes received, in addition to their normal reading program, the special literature program of oral reading by the classroom teacher of books lasting in duration for approximately 20 minutes. The control groups were read to only occasionally--once a month or less--and otherwise had resources only in their classroom libraries. As the program has hierarchically structured and sequentially planned, the books presented to the experimental groups ranged in a planned sequence from those easy in concept presentation and use of literary devices to those which were much more complex, conceptually and literarily.

During the first four-week period, the books read to the experimental groups were books exploring feelings through fantasy and animal stories.

During the second four weeks, the children explored books which used personification of objects to convey attitudes about feelings. The third four-week period concentrated on the values and literary devices¹ of fairy tales, the fourth four-week period on the concepts and literary devices of fables, the fifth on folk tales, and the sixth on parody and satire. Though it had been planned to devote the seventh four-week period to biography and the eighth to allusion and allegory, this was not carried out and, in the last six weeks, a general review of former themes with newer works was programmed.

The treatment was administered by the classroom teachers, who were provided by the investigator with the books and familiarized with instruction in reading and asking questions about the books in order to ascertain that all groups were exposed to the same literary models of language through which the literature program would provide its strongest contribution toward oral-language proficiency.

Subordinate Problems

1. To determine the effect of reading aloud of a planned literature program independent of outside influences. In order to account for the effect reading at home might have on a child's reading ability, questionnaires (see Appendix I) were submitted to the parents requesting them to indicate how often and what kind of books they read to their children. Across all groups it was found that parents read to the children once a week, with only three parents in the entire population reading to the children once a day and five never reading at all. Thus, outside influences were considered to play no significant differentiating effect upon the reading ability of the sample population.

2. To determine the effect of reading aloud of a planned literature program upon reading interest. Reading interest was measured by placing a chart in each class, on which a child would place a check next to his name each time he read a book rather than engaging in some free-play activity. The findings were not significant, however, as the children from the beginning of the study to the end were as excited about placing their names on the charts as in reading the books, and this measure had to be discounted as inaccurate for revealing the effect of reading on the children's interest in reading.

3. To determine the effect of reading aloud of a planned literature program upon oral proficiency development, or the broadening of basic vocabulary not ordinarily covered in the curriculum.

4. To determine the effect of reading aloud of a planned literature program upon reading ability.

The last two problems were measured by a pretest given on October 23, 1973 (see Appendix II) and a posttest given on May 15, 1973 (see Appendix III). Though 236 subjects were administered the pre and posttest, the sample was randomly reduced to 189 in order to adjust each cell for the same number of 21 subjects. The tests were composed of 28 items; a perfect score of no errors was 0, and the lowest possible score was 28. The correlation coefficient between the pre and posttest was .74 (see Appendix V).

It was predicted that the greatest amount of gain would be made across all groups by those groups exposed to the oral language program five days per week. It was further predicted that all groups exposed to the literature program five days a week would show greater gains in oral proficiency and reading ability than those groups exposed to the treatment once

a week or not at all. Further, it was expected that the greatest amount of gain would be made by the children of lowest experiential background who received the treatment five days per week--that is the L5 group. Lastly, it was predicted that the least amount of gain would be made by the children who had no exposure to the literature program.

Given the data, a test for homogeneity of regression was made, and it was found that the regression was not homogeneous. However, by setting the lines parallel, a meaningful proportion of sums of squares was not lost and the following results were obtained (see Appendix IV). The analysis of covariance revealed that across all conditions, there was an effect due to intelligence and an effect due to treatment. Looking at the contrast of treatment groups versus control, the difference was statistically significant with a probability of less than .05 that the effect was due to other variables than the treatment.

To determine where differences were to be found, the Scheffé test was used, and it was found that, across all conditions, the bright group did better than the middle ability group. It was also found that both the bright and middle ability groups were significantly superior to the low ability group, with a probability of less than .01 that this was due to chance rather than to the treatment.

Looking at the graph of the difference in means scores on the pre and posttest, it is clear that the prediction that the groups read to would make greater gains than those not read to was borne out. The lines of regression for the L5 group is not as regressed as expected, and the prediction that the L5 group would make the greatest gains was not borne out (see Appendix V). Further, the prediction that those groups read to five days

a week would do better than those read to one day a week was also not borne out. Rather, as computed, the study showed that, across all ranges of intelligence, it made no difference whether the children were read to five days a week or one day a week, but that reading did make a statistically significant difference, with a probability of less than .05 that the difference was not due to the treatment. However, subsequent analyses revealed that this did not hold up for the low ability group.

Conclusions

From the analysis of the data computed orthogonally, as presented above, it must be concluded that for bright and average groups, the effect of reading aloud to six year olds once a week will produce gains in reading ability as statistically significant as those achieved by reading five days a week. Further, reading to children once a week will result in reading gains statistically significant over not reading to children at all. However, for children of lower intellectual experiential background, reading children's literature aloud does not have a statistically significant effect on their reading ability.

Because the data were computed orthogonally, it was not possible to compare the mean gain on the pre and posttest between any two specific groups without imbedding the information in equations including the means of other groups, thus making the comparisons between any two specific groups less refined. Looking at the means on the pre and posttests (see Appendix VI) and the Adjusted Means (see Appendix VII) seems to indicate that other results might be obtained by computing the data in a non-orthogonal run, thus making possible refined comparisons of any two specific groups' performance. Further, a comparison of difference in gain scores must be made before final conclusions are postulated.

APPENDIX I

QUESTIONNAIRE

Your child's class has been chosen for the introduction of a formal program of Children's Literature into our First-Grade Curriculum. To help us assess the needs of the program, would you please answer the following questions?

1. Do you read children's books to your child? If so, how often?

_____ once a week _____ once a month
_____ once a day _____ other

2. Do older brothers or sisters read to your child? If so, how often?

_____ once a week _____ once a month
_____ once a day _____ other

3. Does your child have a favorite book or books? If so, what are they?

4. Does your child have some books he does not like? If so, what are they?

5. What does your child most enjoy reading about? Please indicate:

_____ animals _____ Fairy tales
_____ sports _____ other

Name of child: _____

ORAL LANGUAGE PROFICIENCY TEST

INSTRUCTIONS TO THE TEACHER

Give one pamphlet to each child. See before the test that each child has a pencil and a piece of paper 6 1/2" x 2" to be used as a marker to move from row to row. After the children have their pamphlets, ask them to put their name and the name of their school on the front cover. Then say to the children: "OPEN YOUR BOOKS TO THE FIRST PAGE." (Show the page.) Then say, "LISTEN WHILE I TELL YOU WHAT WE ARE GOING TO DO. IN EACH ROW THERE ARE PICTURES. I WILL SAY A WORD THAT IS IN ONE PICTURE. YOU WILL FIND THE PICTURE OF WHAT I SAID AND PUT AN "X" ON THAT PICTURE. LET'S TRY IT. TAKE YOUR MARKER AND PLACE IT UNDER THE FIRST ROW AT THE TOP OF THE FIRST PAGE. (Demonstrate so that the children can see how to do this and are at the correct place.) NOW, LOOK AT THE PICTURES IN THIS ROW. FIND THE CAMEL. PUT AN "X" ON IT. IF YOU MAKE A MISTAKE AND PUT AN "X" ON THE WRONG THING, SCRATCH IT OUT WITH YOUR PENCIL THIS WAY -" , AND THEN PUT AN "X" ON THE THING I NAMED. DO NOT ERASE. (Demonstrate on the board so this is clear to the children.) DOES EVERYONE UNDERSTAND? (Repeat directions if necessary, demonstrating scratching out and then putting an "x" in the proper place.) Now say, "ALL RIGHT, NOW LET'S BEGIN. PICK UP YOUR PENCILS AND PLACE YOUR MARKER AT THE NEXT ROW. (Wait 10-15 seconds for the children to make each row.)

Now say, "LOOK AT THE PICTURES. FIND THE MOUNTAIN. PUT AN "X" ON THE MOUNTAIN." After 15 seconds say, "MOVE YOUR MARKER TO THE NEXT ROW." "FIND THE GIRAFFE. PUT AN "X" ON THE GIRAFFE. After 15 seconds say, "MOVE YOUR MARKER TO THE NEXT ROW. FIND THE BARN. MAKE AN "X" ON THE BARN.

NOW MOVE YOUR MARKER TO THE NEXT ROW. FIND THE LAKE. MAKE AN "X" ON THE LAKE.

NOW MOVE YOUR MARKER TO THE NEXT ROW. FIND THE SNOWFLOW. MAKE AN "X" ON THE SNOWFLOW.

NOW FIND THE BARREL. MAKE AN "X" ON THE BARREL.

Now say, "PUT YOUR PENCIL AND MARKER DOWN. TURN YOUR PAMPHLETS TO THE NEXT PAGE. PLACE YOUR MARKER UNDER THE FIRST ROW AT THE TOP OF THE PAGE. (Demonstrate). LOOK AT THE PICTURES IN THE FIRST ROW. FIND THE PICTURE OF THE DOG PANTING. MAKE AN "X" ON THE DOG PANTING. MOVE YOUR MARKER TO THE NEXT ROW.

LOOK AT THE PICTURES. MAKE AN X ON THE KANGAROO. MOVE YOUR MARKER TO THE NEXT ROW. LOOK AT THE PICTURES. MAKE AN "X" ON THE DUCK. MOVE YOUR MARKER TO THE NEXT ROW. LOOK AT THE PICTURES. MAKE AN "X" ON THE DOOR WHICH IS SHUT. MOVE YOUR MARKER TO THE NEXT ROW.

LOOK AT THE PICTURES. MAKE AN "X" ON THE PICTURE OF THE MAN SKIING. MOVE YOUR MARKER TO THE NEXT ROW. LOOK AT THE PICTURES. MAKE AN "X" ON THE PICTURE OF THE LADY FLOATING. MOVE YOUR MARKER TO THE NEXT ROW. LOOK AT THE PICTURES. MAKE AN "X" ON THE PACKAGE BEING

ORAL LANGUAGE PROFICIENCY TEST

INSTRUCTIONS TO THE TEACHER

Now say, PUT YOUR MARKER UNDER THE PICTURES IN THE FIRST ROW AT THE TOP OF THE PAGE. MAKE AN "X" ON THE PICTURE OF THE MAN CAMPING.

MOVE YOUR MARKER TO THE NEXT ROW. MAKE AN "X" ON THE PICTURE OF THE MAN LOOKING AT A MAP.

MOVE YOUR MARKER TO THE NEXT ROW. LOOK AT THE PICTURES. MAKE AN "X" ON THE PICTURE OF THE HARDWARE STORE. MOVE YOUR MARKER TO THE NEXT ROW. MAKE AN "X" ON THE SAW. MOVE YOUR MARKER TO THE NEXT ROW. MAKE AN "X" ON THE PICTURE OF THE SCARECROW. MOVE YOUR MARKER TO THE NEXT ROW. LOOK AT THE PICTURES. MAKE AN "X" ON THE MOTORBOAT. MOVE YOUR MARKER TO THE NEXT ROW. LOOK AT THE PICTURES. MAKE AN "X" ON THE FIRE HYDRANT.

Now say, PUT DOWN YOUR MARKERS AND PENCILS. NOW TURN YOUR BOOKS TO THE NEXT PAGE. PUT YOUR MARKER UNDER THE PICTURES IN THE FIRST ROW AT THE TOP OF THE PAGE.

Now say, SEE THE PICTURES OF THE LADY. PUT AN "X" ON THE PICTURE IN WHICH THE LADY LOOKS ANGRY.

MOVE YOUR MARKER TO THE NEXT ROW. SEE THE PICTURES OF THE ROAD. MAKE AN "X" ON THE WIDEST ROAD. MOVE YOUR MARKER TO THE NEXT ROW. LOOK AT THE PICTURES. MAKE AN "X" ON THE THING WHICH IS FURRY.

MOVE YOUR MARKER TO THE NEXT ROW. LOOK AT THE PICTURES. MAKE AN "X" ON THE TRUCK WHICH IS BEHIND THE BUS. MOVE YOUR MARKER TO THE NEXT ROW.

LOOK AT THE PICTURES. MAKE AN "X" ON THE PICTURE OF THE SHORTEST GIRL.

MOVE YOUR MARKER TO THE NEXT ROW. LOOK AT THE PICTURES. MAKE AN "X" ON THE SCENE OF FALL.

MOVE YOUR MARKER TO THE NEXT ROW. LOOK AT THE PICTURES OF THE JARS OF CANDY. MAKE AN "X" ON THE JAR WHICH IS HALF FULL.

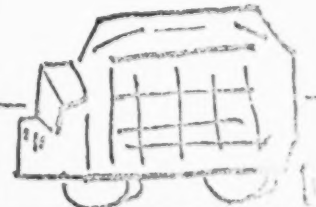
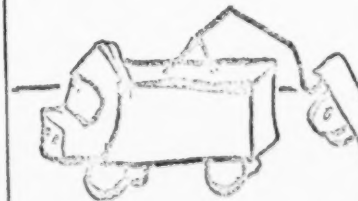
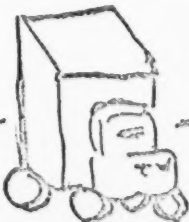
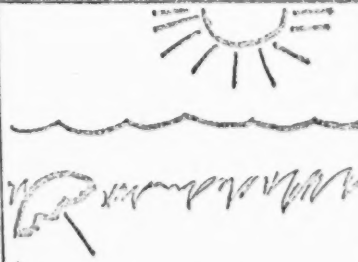
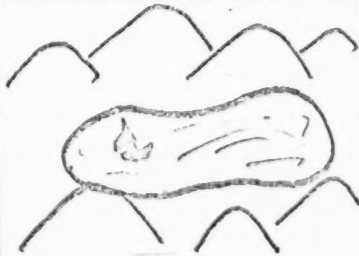
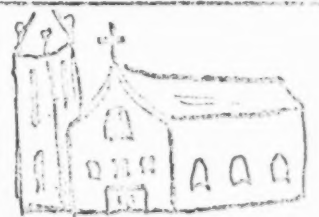
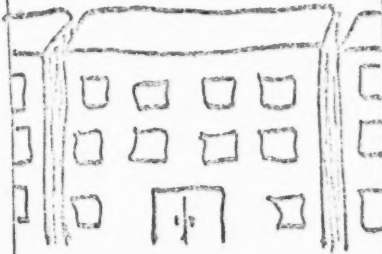
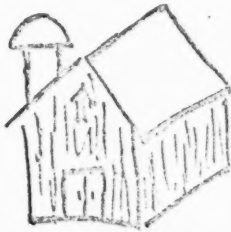
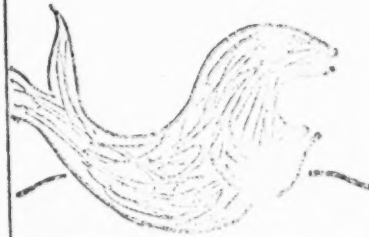
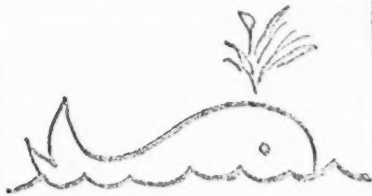
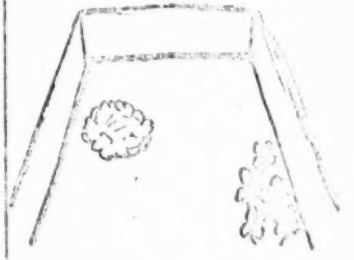
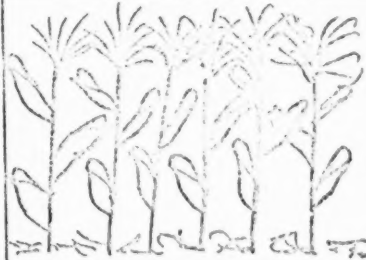
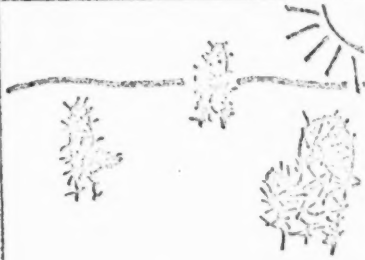
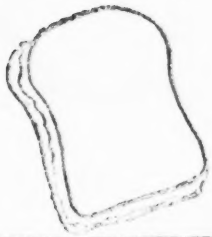
Now say, PUT YOUR PENCILS AND MARKERS DOWN AND CLOSE YOUR BOOKS. SIT QUIETLY WHILE I COLLECT YOUR BOOKS.

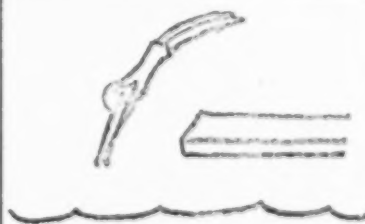
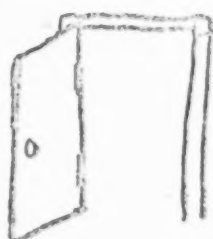
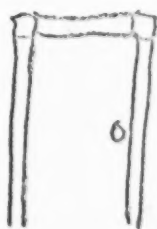
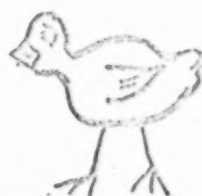
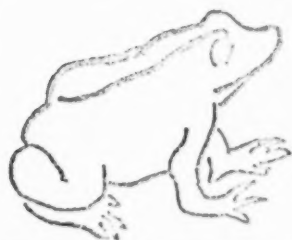
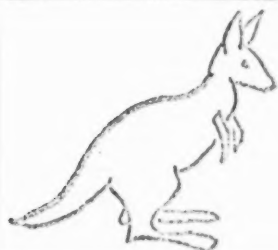
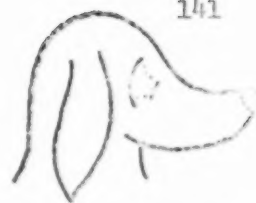
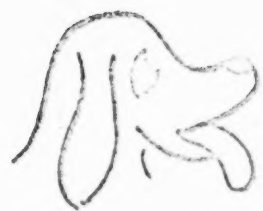
ORAL LANGUAGE PROFICIENCY TEST

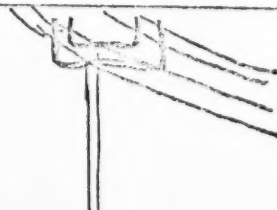
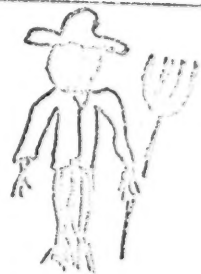
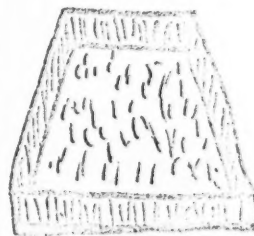
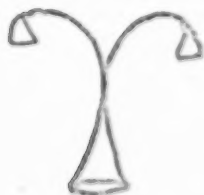
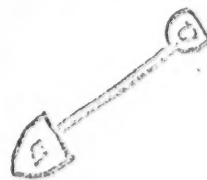
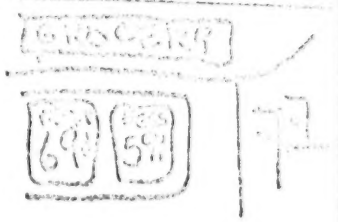
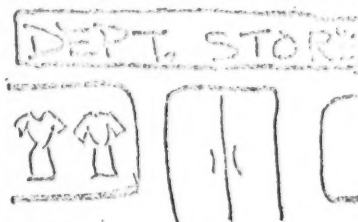
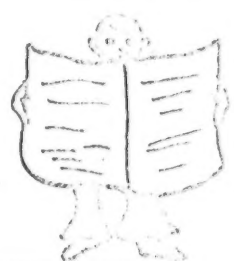
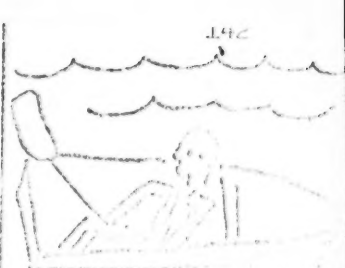
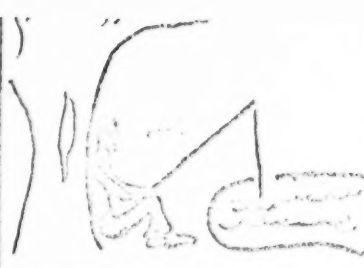
PRIMARY LEVEL

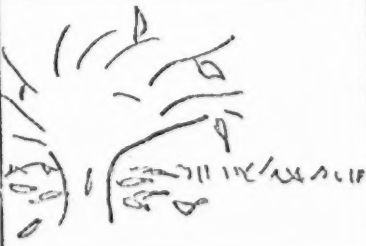
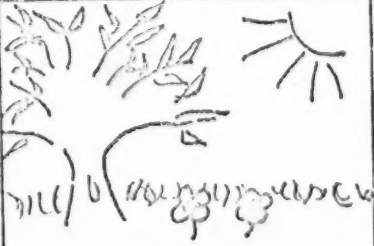
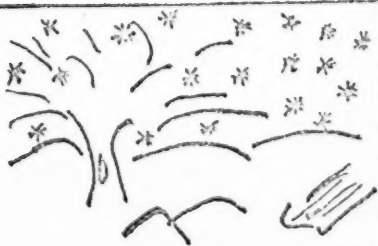
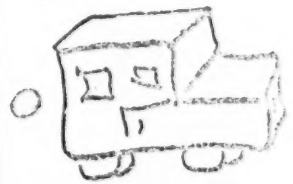
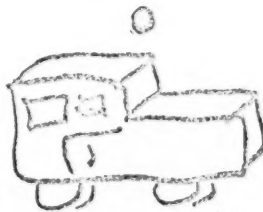
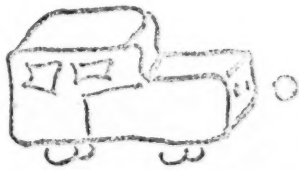
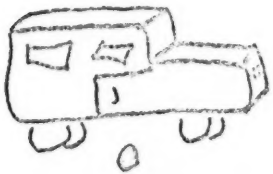
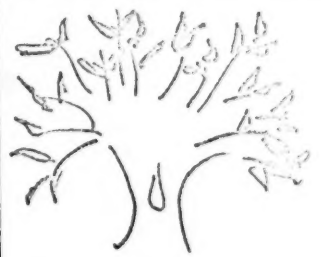
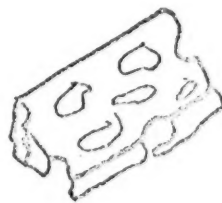
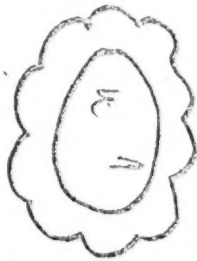
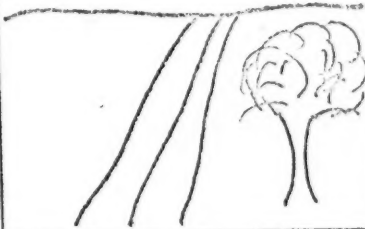
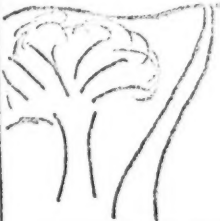
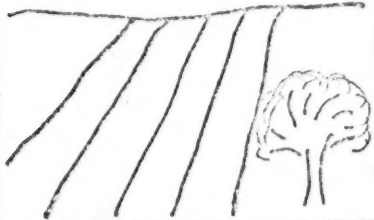
NAME _____

NAME OF SCHOOL: _____









APPENDIX III

ORAL LANGUAGE PROFICIENCY TEST

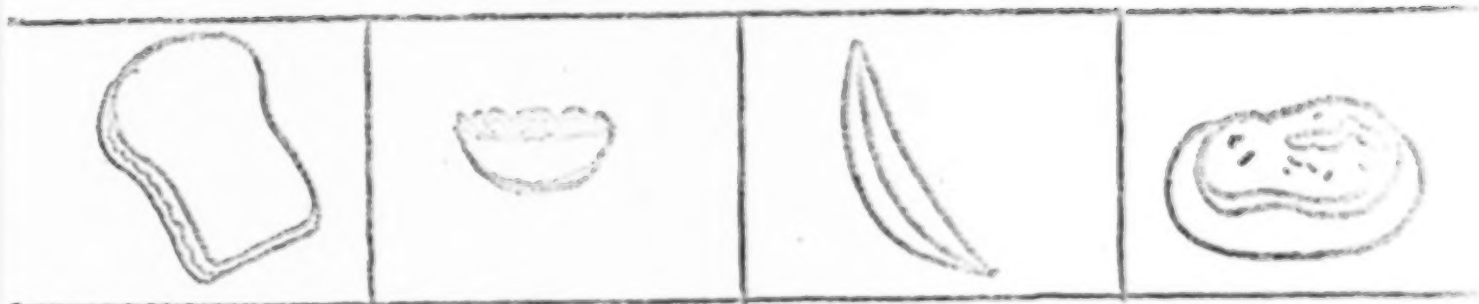
PRIMARY LEVEL

NAME: _____

NAME OF SCHOOL: _____

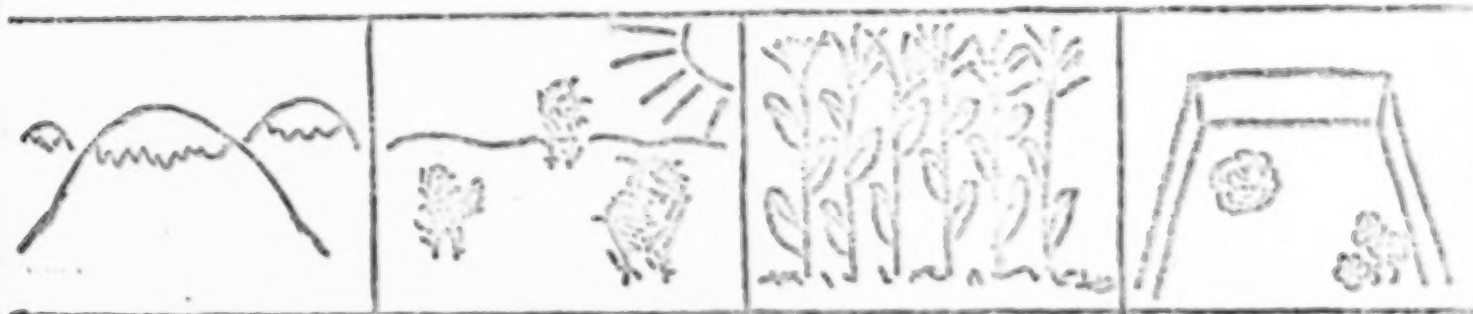
LOOK AT THE PICTURES IN THE ROW.

MAKE AN X ON THE PICTURE OF THE BANANA.



LOOK AT THE PICTURES IN THE ROW.

MAKE AN X ON THE PICTURE OF THE MOUNTAIN.



LOOK AT THE PICTURES IN THE ROW.

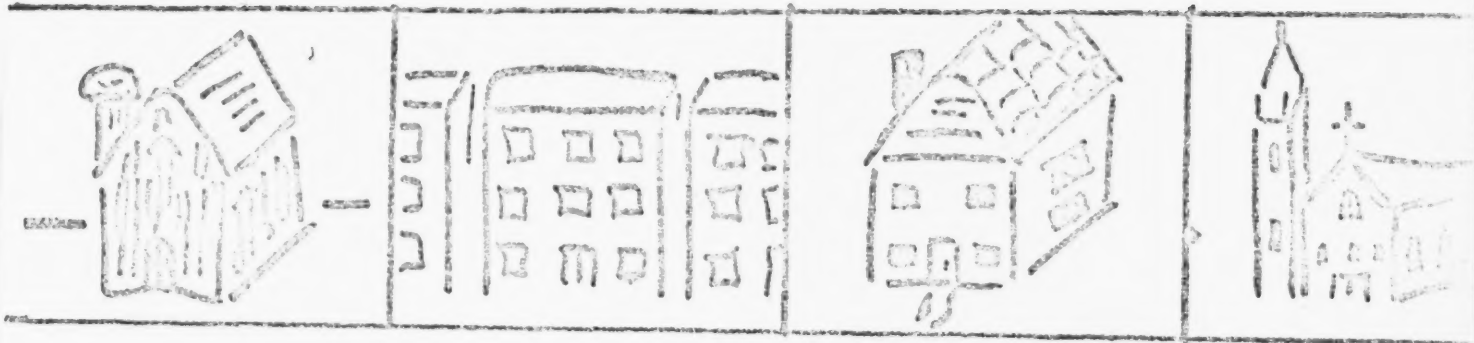
MAKE AN X ON THE PICTURE OF THE GIRAFFE.



LOOK AT THE PICTURES IN THE ROW.

146

MAKE AN X ON THE PICTURE OF THE BARN.



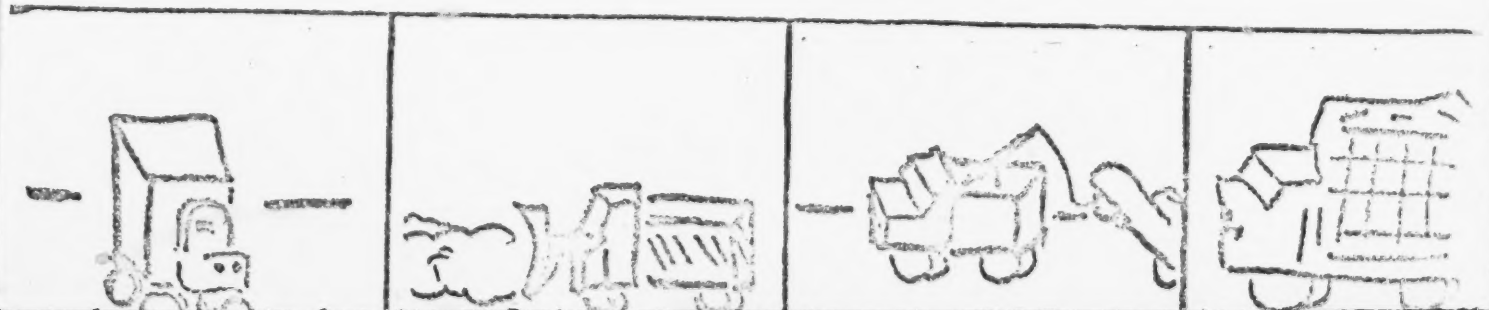
LOOK AT THE PICTURES IN THE ROW.

MAKE AN X ON THE PICTURE OF THE LAKE.



LOOK AT THE PICTURES IN THE ROW.

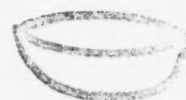
MAKE AN X ON THE PICTURE OF THE SNOWPLOW.



LOOK AT THE PICTURES IN THE ROW.

147

MAKE AN X ON THE PICTURE OF THE BARREL.



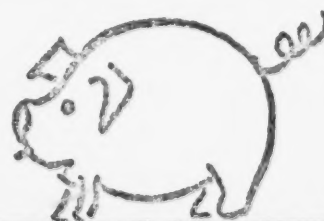
LOOK AT THE PICTURES IN THE ROW.

MAKE AN X ON THE PICTURE OF THE DOG PANTING.



LOOK AT THE PICTURES IN THE ROW.

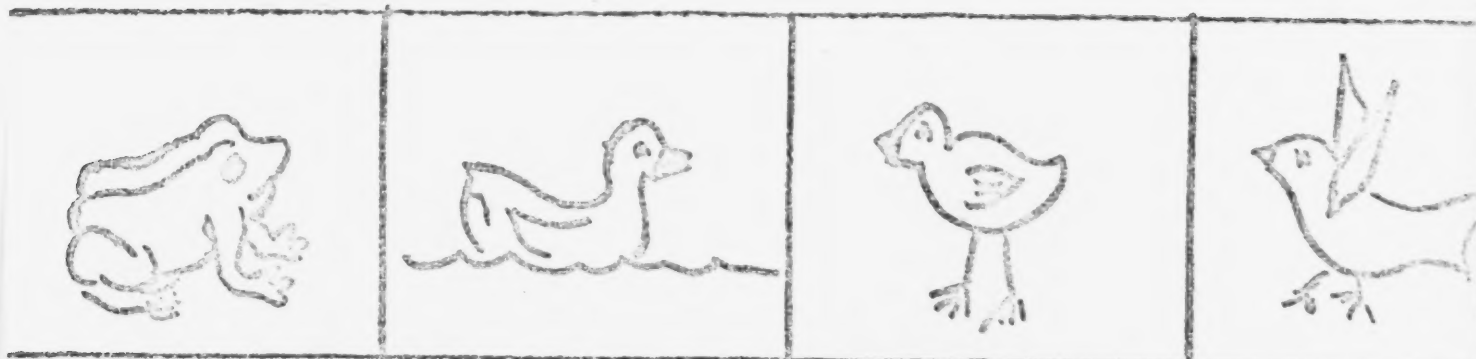
MAKE AN X ON THE PICTURE OF THE KANGAROO.



LOOK AT THE PICTURES IN THE ROW.

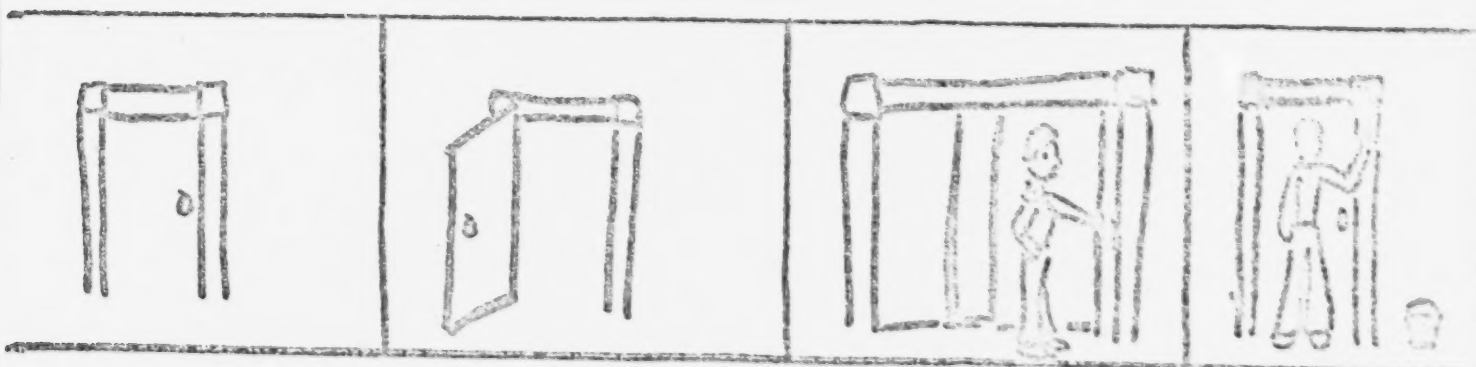
148

MAKE AN X ON THE PICTURE OF THE DUCK.



LOOK AT THE PICTURES IN THE ROW.

MAKE AN X ON THE PICTURE OF DOOR WHICH IS SHUT.



LOOK AT THE PICTURES IN THE ROW.

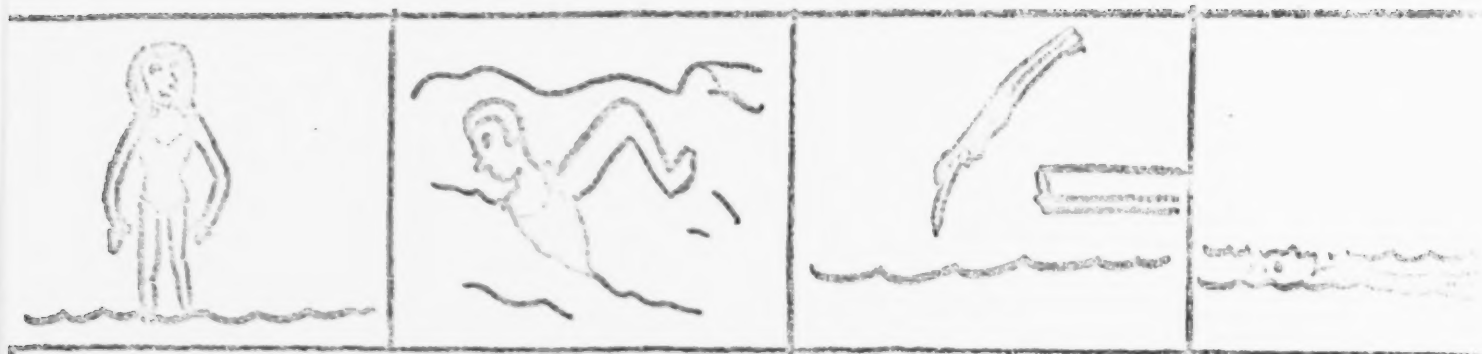
MAKE AN X ON THE PICTURE OF THE MAN SKIING.



LOOK AT THE PICTURES IN THE ROW.

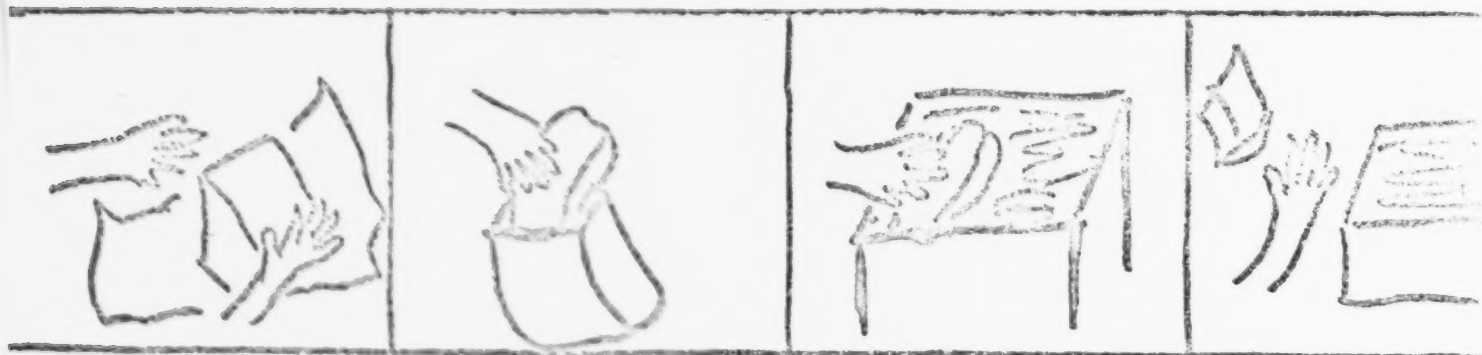
149

MAKE AN X ON THE PICTURE OF THE LADY FLOATING.



LOOK AT THE PICTURES IN THE ROW.

MAKE AN X ON THE PICTURE OF THE BOX BEING WRAPPED.



LOOK AT THE PICTURES IN THE ROW.

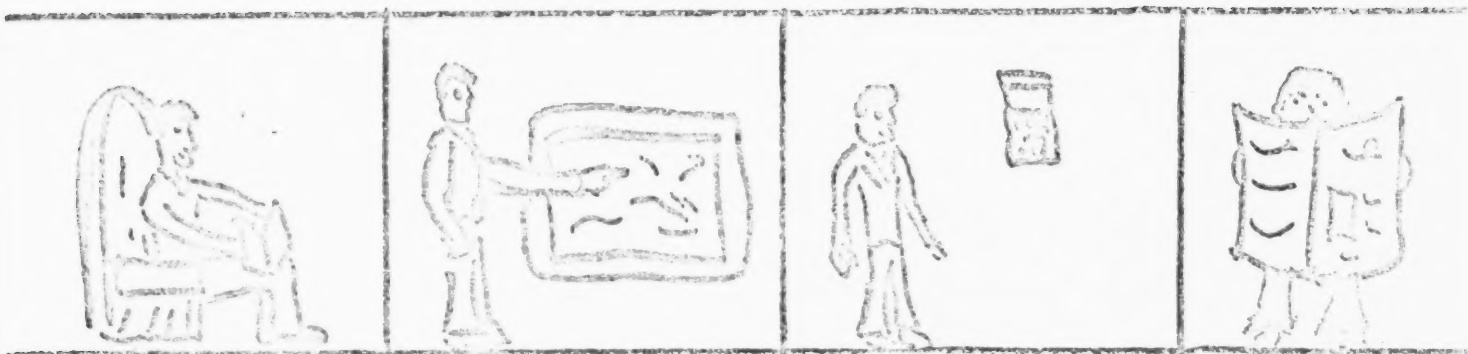
MAKE AN X ON THE PICTURE OF THE MAN CAMPING.



LOOK AT THE PICTURES IN THE ROW.

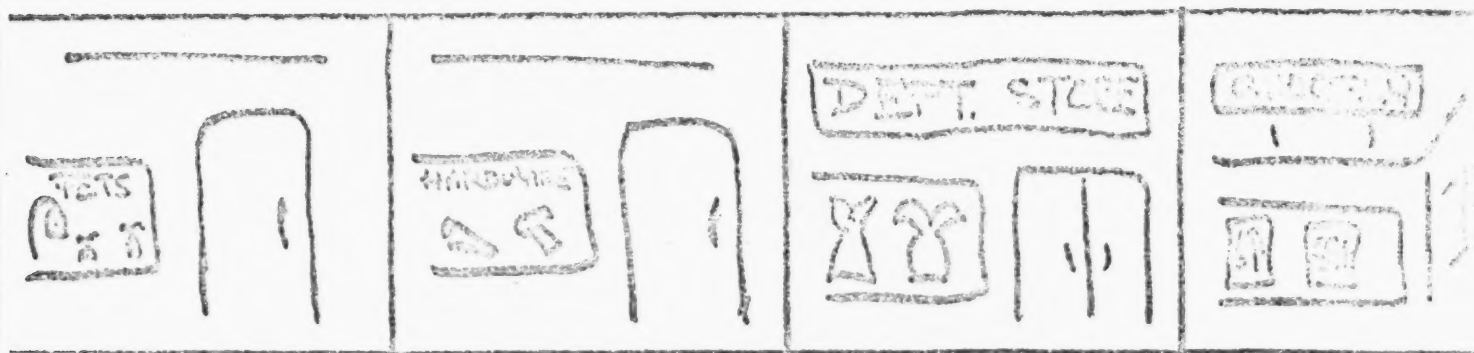
150

MAKE AN X ON THE PICTURE OF THE MAN LOOKING AT A MAP.



LOOK AT THE PICTURES IN THE ROW.

MAKE AN X ON THE PICTURE OF THE HARDWARE STORE.



LOOK AT THE PICTURES IN THE ROW.

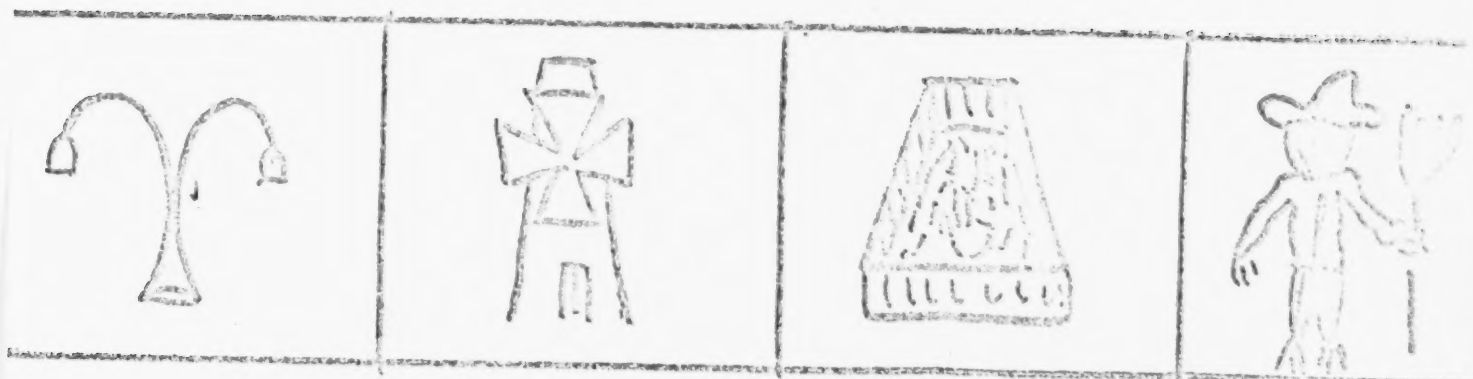
MAKE AN X ON THE PICTURE OF THE SAW.



LOOK AT THE PICTURES IN THE ROW.

151

MAKE AN X ON THE PICTURE OF THE SCARECROW.



LOOK AT THE PICTURES IN THE ROW.

MAKE AN X ON THE PICTURE OF THE MOTORBOAT.



LOOK AT THE PICTURES IN THE ROW.

MAKE AN X ON THE PICTURE OF THE FIRE HYDRANT.



LOOK AT THE PICTURES IN THE ROW.

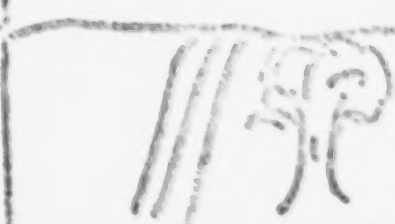
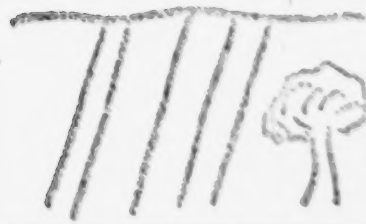
152

MAKE AN X ON THE PICTURE OF THE ANGRY LADY.



LOOK AT THE PICTURES IN THE ROW.

MAKE AN X ON THE PICTURE WIDEST ROAD.



LOOK AT THE PICTURES IN THE ROW.

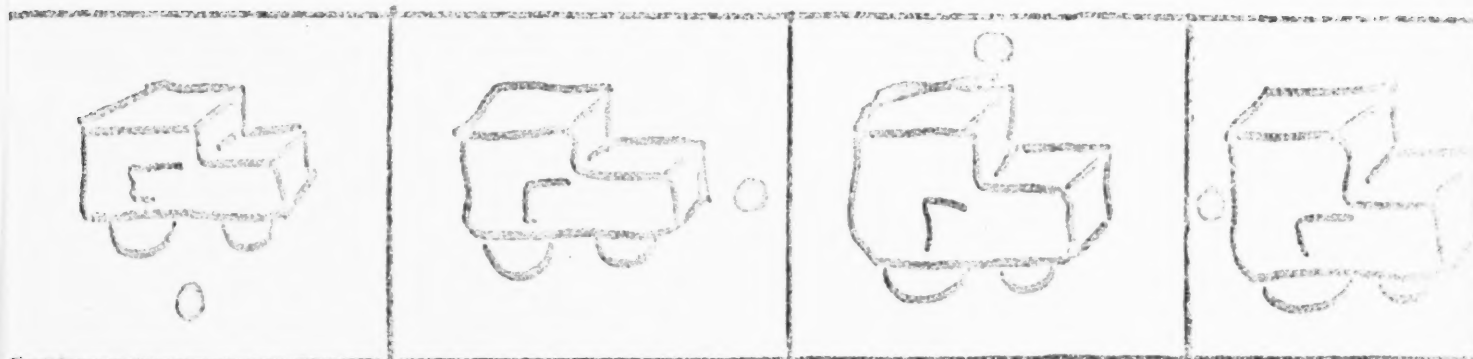
MAKE AN X ON THE PICTURE OF THE FURRY THING.



LOOK AT THE PICTURES IN THE ROW.

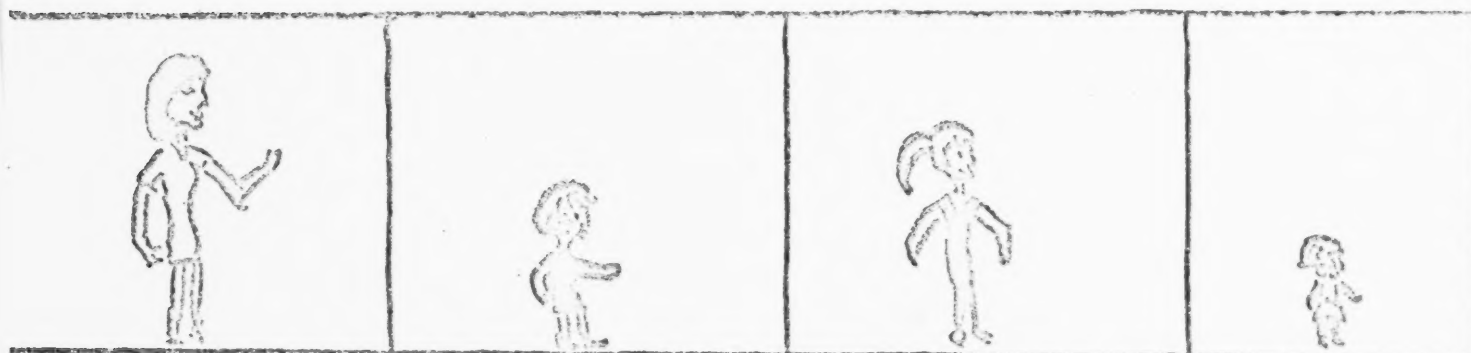
153

MAKE AN X ON THE PICTURE OF THE TRUCK WHICH IS BEHIND THE DOT.



LOOK AT THE PICTURES IN THE ROW.

MAKE AN X ON THE PICTURE OF THE SHORTEST GIRL.



LOOK AT THE PICTURES IN THE ROW.

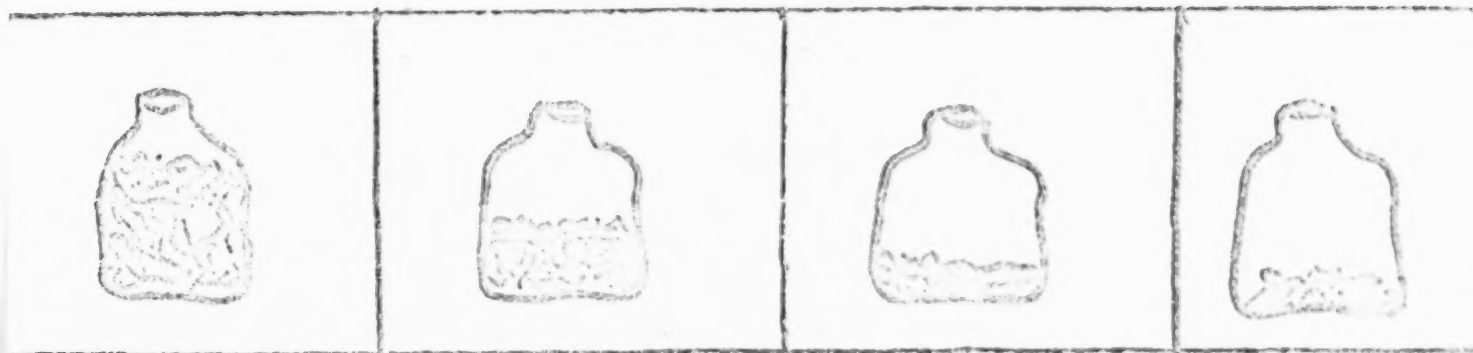
MAKE AN X ON THE PICTURE OF FALL.



LOOK AT THE PICTURES IN THE ROW.

154

MAKE AN X ON THE PICTURE OF THE JAR WHICH IS HALF FULL.



THE END

APPENDIX IV

ANALYSIS OF COVARIANCE

Source	Sums of Squares	DF	MS	F
Due to Treatment (Adj)	510.70420	2	255.35210	*13.14970
Due to Intelligence (Adj)	1344.91478	2	672.45739	*39.23912
Treatment X Intelligence (Adj)	238.36792	4	59.59198	* 3.47730
Within (Adj)	3067.59863	179	17.13742	
Total (Adj)	5161.58553	187		

* $p < .01$ $N = 189$

APPENDIX VI

GROUP	$\bar{X}$	S.D.	$\bar{Y}$	S.D.
B5	3.2857	.16169	4.0000	.29155
B1	4.8095	.22939	7.8095	.67869
BC	5.0476	.30245	10.3333	.50233
M5	12.9047	.60076	14.1428	.35254
M1	6.4286	.32645	13.0952	.36866
MC	5.4762	.39449	13.4285	.47072
L5	10.1905	.35302	17.5714	.42612
L1	8.1905	.32499	13.9523	.37614
LC	7.6667	.36788	18.0476	.35705

APPENDIX VII

ADJUSTED MEANS

B5	5.5749
R1	8.7570
BC	11.1828
M5	11.7576
M1	13.3761
MC	14.1016
L5	16.3036
L1	13.5030
LC	17.8189

TEACHER OPINIONNAIRE

1. Reading aloud to children increases their ability to read
☐ Not at all ☐ Moderately
☐ Very little ☐ Significantly ☐ Extremely
2. Reading aloud to children increases their interest in reading
☐ Not at all ☐ Moderately
☐ Very little ☐ Significantly ☐ Extremely
3. Reading to children increases their language proficiency
☐ Not at all ☐ Moderately ☐ Extremely
☐ Very little ☐ Significantly
4. Only high-quality works of children's literature should be read in the classroom
☐ Strongly agree ☐ Disagree
☐ Agree ☐ Strongly Disagree ☐ No opinion
5. Children enjoy being read to and the quality of the book, if enjoyable, is of little importance
☐ Strongly agree ☐ Disagree
☐ Agree ☐ Strongly Disagree ☐ NO opinion
6. Works of complex literary devices should not be read to children at the first-grade level
☐ Strongly agree ☐ Disagree
☐ Agree ☐ Strongly Disagree ☐ No opinion

7. Children should be read to for the joy of reading and literary criticism should not be part of a first-grader's literary experience
- ____ Strongly agree ____ Disagree
 ____ Agree ____ Strongly disagree ____ No opinion
8. Discussing elements of literature is inappropriate for first-grade children
- ____ Strongly agree ____ Disagree
 ____ Agree ____ Strongly disagree ____ No opinion
9. Books which deal with children's problems are inappropriate for first-grade children
- ____ Strongly agree ____ Disagree
 ____ Agree ____ Strongly disagree ____ No opinion
10. Reading aloud to children should be a daily requirement of the first-grade curriculum
- ____ Strongly agree ____ Disagree
 ____ Agree ____ Strongly disagree ____ No opinion

Please rank order the types of books most appropriate for first-grade children: (Assign "1" to the most appropriate, etc.)

____ Realistic fiction	____ Fables	____ Parody
____ Fantasy	____ Animal Stories	____ Allegory
____ Poetry	____ Biography	____ Non-fiction
____ Fairy Tales	____ Legends	____ Other

11. Children's literature should be used as material for teaching basic reading skills

____ Strongly agree ____ Disagree

____ Agree ____ Strongly Disagree ____ NO opinion

12. Creative dramatics contributes to children's comprehension of reading material

____ Strongly agree ____ Disagree

____ Agree ____ Strongly Disagree ____ No opinion

13. If a good classroom library is available, it is less necessary to read aloud to the children daily.

____ Strongly agree ____ Disagree

____ Agree ____ Strongly Disagree ____ No opinion

Please fill in the following information:

Years of teaching experience _____

Years teaching first-grade _____

Date of Degree _____

Institution from which degree earned _____

Other conferences or workshops you may have attended:

Courses in children's literature you have taken:

List the Children's or Book Review sources that you regularly read
or have access to:

(This study is summarized above as Report No. 10.)

A STUDY OF PUPIL PERFORMANCE IN MATHEMATICS

Submitted to:
Model Educational Research
Training Program
School of Education
New York University

A STUDY OF PUPIL PERFORMANCE IN MATHEMATICS

The Nature of the Problem

Mathematical ability is necessary throughout life. There are few situations that do not have some mathematical implications. It is imperative that children know a great deal of math in order to function properly in this world. Many children in District 7 Bronx will be at a great disadvantage later on in life because they have begun to fall behind in math. The purpose of this study is to discover how a program of mathematics integrated with science will affect pupil understanding of mathematics concepts.

Statement of the Problem

Does mathematics taught in a functional science setting affect pupil math concepts scores? Does this type of instruction affect pupil attitudes toward mathematics?

Specific Problems

How will a program of mathematics integrated with science affect pupil math concepts scores? What effect does this type of program have on student attitudes toward mathematics?

Definition of Terms

Integrated Program: a program in which branches of knowledge are brought together to make a whole is integrated. The program to be used is COPES--Conceptually Oriented Program in Elementary Science.

COPES: Conceptually Oriented Program in Elementary Science is a science curriculum development project of the Center for Field Research and School Services of New York University.

Math Concepts: the mathematical concepts that will be taught through this program will be probability, statistics, measurement, and graphs.

Hypotheses

Pupils taught mathematics with the portions of COPES that are integrated with mathematics will score higher on math concepts tests than those pupils that did not receive treatment.

Pupils will have a more favorable attitude toward mathematics when taught in the functional setting of COPES.

Related Research and Literature

Some of the problems of mathematics instruction are cited by Kidd, Myers and Cilley (1970):

"In recent curriculum development more emphasis has been placed on structuring or organizing the ideas of mathematics. In general, however, teachers and authors are still attempting to reveal this organization to the students by expository methods. Too frequently the students are helped to discover this organization by personal involvement. Even the integration and refinement of this knowledge is carried out by the teacher for the student rather than by the student for himself.

Today too little attention is being given to the other goals of instruction. Many students are not getting the type of experience with objects that would enable them to form meaningful mathematical concepts.

We also need to give more emphasis to the development of favorable attitudes toward mathematics. Research tells us that there is a positive correlation between a student's attitude and his achievement in mathematics (N.C.T.M., Twenty-first Yearbook, pp. 55-56). We must face the fact that an alarmingly large number of students possess unfavorable attitudes towards mathematics. They have a history of failure in this subject; they are threatened by mathematics and no one expects them to be successful in it. Their teachers, parents and classmates expect them to fail; therefore they expect the same. Many of them are disorganized; they do little planning, actions are random, and

concern is for immediate goals. It has been shown, however, that the attitudes of underachieving students can be improved and that such improvement will lead to improved performance (N.C.T.M., Twenty-first Yearbook, pp. 56-57)." (p. 10)

In conclusion, the Nuffield Education Project (1967) states:

"Children are endowed with natural curiosity, which will lead them to investigate an environment that is rich, varied, ever-changing and quite irresistible. Such explorations will develop a sense of adventure, and lead to the delight of achievement. More than this the children may even experience a sense of wonder and excitement as they gain insight into relationships that constitute the world of mathematics." (p. 45)

Experimental Design

A great deal of emphasis has been placed on computational skills in mathematics learning. Pupils do not always understand the basic concepts on which these computations are based. The approach to these concepts through science should provide greater insight for students.

Two equivalent groups of fourth grade pupils who live in the south Bronx will be studied. One group will be taught the regular mathematics curriculum. The other group will be taught the integrated mathematics curriculum with COPEs materials used for instruction in probability, statistics, measurement, and graphs.

A pretest (MAT, 1972)--posttest control group design will be used. Metropolitan Achievement Tests will be administered in April. The results will be compared with the pupils' third grade MAT scores to see whether there has been a significant difference. A special test of the COPEs mathematics concepts will be devised and used as post-test for both groups. A questionnaire will also be given to the members of both groups to determine their attitudes toward mathematics.

Statistical Hypotheses to be Tested

There will be no difference in math concepts test scores between pupils taught mathematics with the portions of COPES that are integrated with mathematics and those pupils who did not receive the treatment.

There will be no difference in attitude toward math in the two groups of students.

Social and Organizational Context of the Study

The study was made in Community School District 7, which covers the area from the southernmost tip of the Bronx north to 161st Street enclosed by the East and Harlem Rivers. The Plan for New York City:

The Bronx (1969) states:

Bleak tenements line block after block of the South Bronx. The teeming residential district is peppered with shabby warehouses, lofts, garages, marginal businesses Major action is urgent and is now under way. Much of the district is included in the South Bronx Model Cities area and will benefit from new and expanded social programs as well as from physical redevelopment. A new educational complex on the northwestern edge of the district will include an elementary school, an intermediate school, a community college and a much-needed high school to serve the area.

Portions of this educational park have already been completed. Other improvements are constantly being added. There are many public housing developments in the South Bronx, but still a great many families live in substandard accommodations. This condition leads to the mobility of the population. Residents are constantly striving to find better places to live.

The estimated 180,000 residents of the South Bronx are members of many different ethnic and racial groups. The elementary and intermediate

school population of approximately 30,000 pupils is about 66% Puerto Rican and Hispanic, 31% Black and 3% other (German, Irish, Jewish, Chinese, etc.). The economic level of the district residents is generally low as is evidenced by the fact that all district schools are designated as Title I schools. That is, funds are provided by the federal government to compensate students for educational disabilities caused by economic deprivation.

The two elementary schools in which the study was made are near public housing projects. Some of their students live in the projects, while others come from nearby tenements. One school was built in 1952 and is 103% utilized. It has a student population of about 975 with 38 teachers. The other school was built in 1961 and is 110% utilized. Its student population is 1195 with 46 teachers. Each school is close to the intermediate school to which its students will be sent.

Theoretical Basis of the Study

The problem of teaching mathematics is complex. Lee S. Shulman discusses some of the theoretical considerations in *Psychological Controversies in Teaching Science and Mathematics*, an article in Learning Environments. He presents Jerome Bruner's theory that the emphasis should be on the processes of learning, not on the product--the discovery approach, and Robert Gagne's theory that the objectives of instruction are capabilities--behavioral products that can be specified in operational terms. A combination of these theories would be a "guided discovery treatment in which the subjects are carefully directed down a particular path along which they are called upon to discover regularities and solutions on their own. They are provided with cues in a carefully programmed manner, but the actual statement of the principle or problem is left up to them." COPES is an example of this type of treatment.

The experiment with COPES materials used to teach some mathematical concepts is based on another of Bruner's theories, the transfer of training. "Broad transfer of training occurs when one can identify in the structures of subject matters basic, fundamentally simple concepts or principles which, if learned well can be transferred both to subject matters within that discipline and to other disciplines as well."

From the ideas expressed above, the survey of other related literature, as well as personal observation, I believe that children learn mathematics concepts better in a functional setting. A group of fourth grade pupils in the South Bronx was selected for the study. They were to be taught probability, statistics, measurement and graphs (topics in the New York City Board of Education Mathematics Scope and Sequence for Fourth Grade) using applicable portions of COPES. A control group of comparable students taught in a regular mathematics setting was also selected. There should be a significant difference on the 5% level between the understanding of these mathematics concepts by the two groups as measured by their scores on MAT's and a specially devised test of these concepts.

A test was given to both groups based on the material covered in COPES--Averaging and Sampling, Heat Energy and Water. The mean of the treatment group was 8, and that of the control group was 4. These results were not unexpected. The students in the treatment group who had been getting all answers correct made some mistakes. Pupils in the control group were unfamiliar with the terminology of COPES, but were able to answer some questions. This illustrates an advantage of using COPES: students acquire an increased science vocabulary as they learn mathematics in a functional setting. (The COPES test appears in Appendix I of this report.)

The Arithmetic Inventory used in ESEA Title I Report, An Evaluation of the Corrective Mathematics Services for Disadvantaged Pupils in Non-Public Schools was given to discover student attitude toward arithmetic. The pupils circled the statement that most clearly interpreted their feelings. The inventory was scored by using the circled numbers above each statement. The distance between the values is not the same as it was felt that "never" was more distant from "sometimes" than "sometimes" is from "most of the time." The inventory was given to both treatment and control groups. (This inventory appears in Appendix II.)

The mean of the treatment group was 63, and that of the control group was 66. This shows that both groups had a positive attitude toward mathematics, as over 60 was to considered favorable. (The teacher of the control group stated that the children loved to do computation, but had difficulty with concepts.)

To test the hypothesis, an analysis of covariance was performed. First, a test for homogeneity of regression was made. This test was to determine if the two lines (representing COPES and control) were parallel. That is, to discover if the initial deviation from parallelism was due to sampling error. The lines were parallel, therefore, a test on the means that had been adjusted for initial differences on 1972 MATs was made. The results are presented in Table 1.

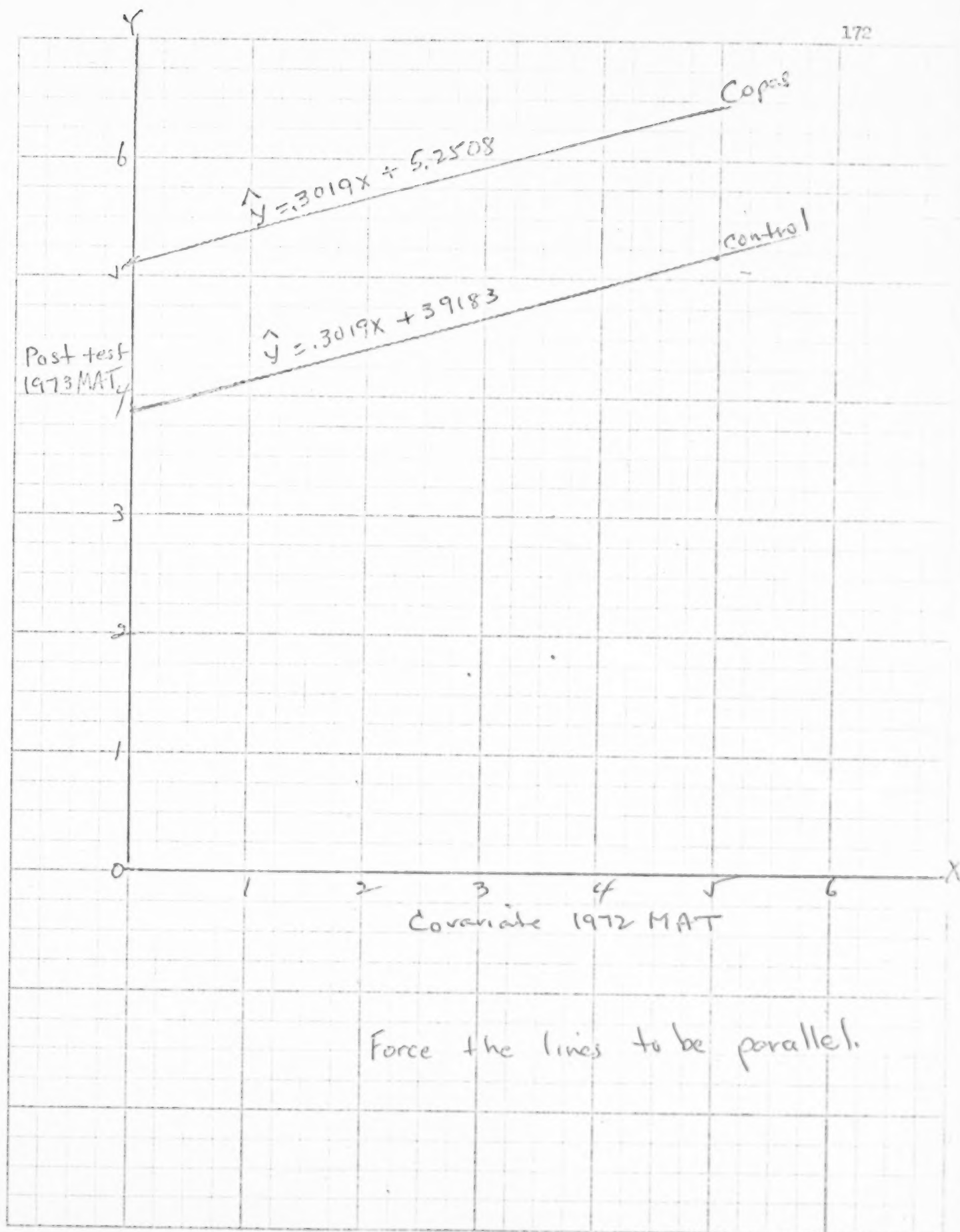
The table shows that there was a highly significant difference in performance between the two groups after adjustments were made. Clearly the use of COPES material resulted in greater achievement in mathematics concepts than the use of traditional curriculum materials.

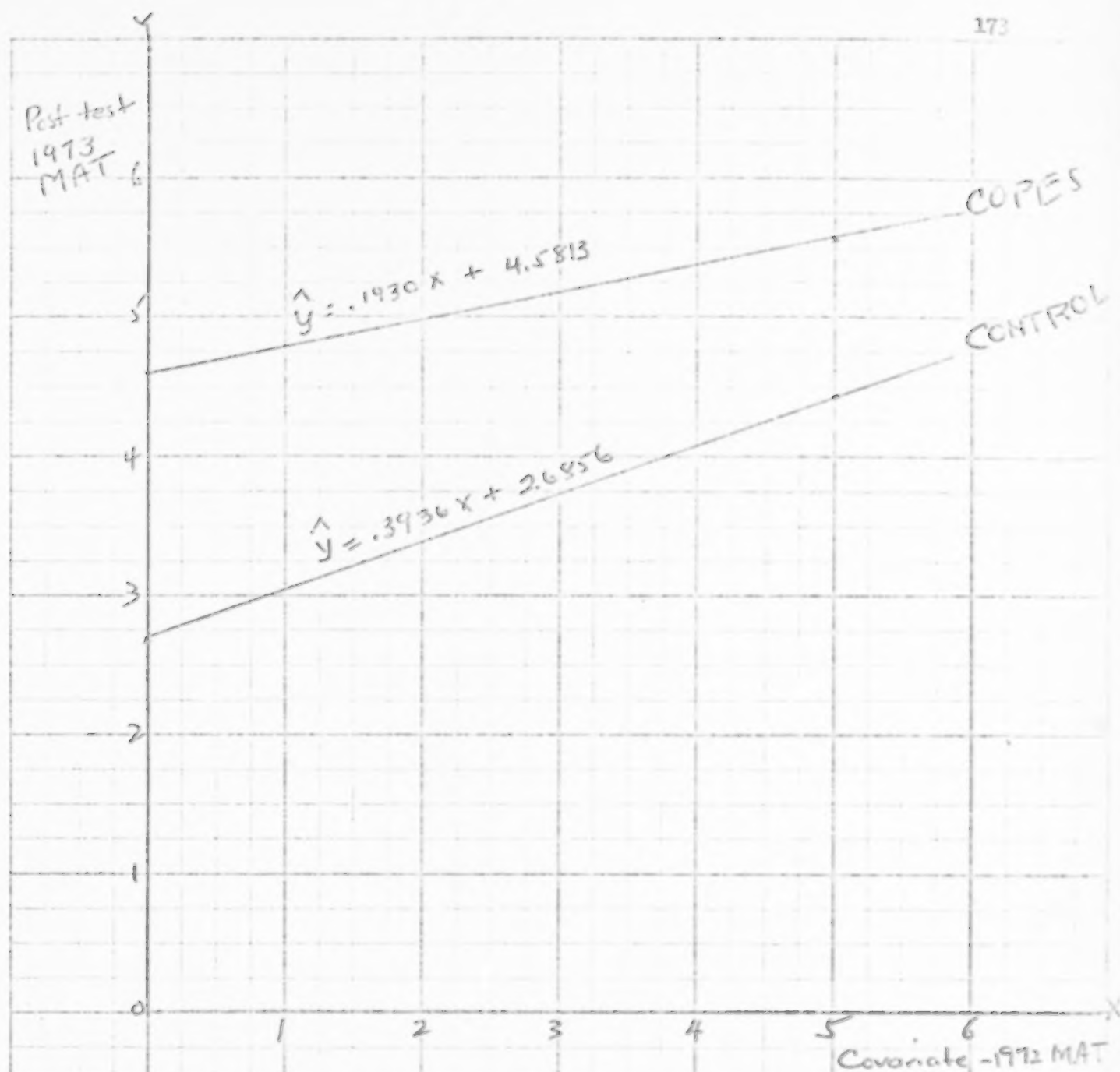
TABLE 1

Source	SS	df	MS	F
Between (adj.) (Group Membership-adj.)	10.05092	1	10.05092	12.784*
Within (adj.)	32.23808	41	0.78629	
Total (adj.)	42.28900	42		

* p .005

1972 MAT (Covariate)			1973 MAT	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.
COPES	4.1555	0.6732	5.3833	1.1754
Control	3.4077	0.60527	4.0269	0.6416





Let each group line take its
own trend.

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COPING Test

1. Page A, top. Some children in a class counted how many pencils each child had. The bar graph at the top of the page shows how many pencils each of five children had. Below the bar graph are some numbers. One of them shows what the average number of pencils is. Draw a circle around it.
2. Page A, bottom. The names of four children are shown at the bottom of the page. The number of brothers that each child has is written below each name. Make a bar graph by shading the rectangles to represent how many brothers each child has. (Pause for about 90 seconds.) Now determine the average number of brothers for the group and write it on the dashed line.
3. Page B, top. The children in a class were going to share some marbles which were in a bag. Each child put his hand in the bag and took out some marbles. The number of marbles that each child took out is shown at the top of the page. The children are going to share the marbles equally. Draw a circle around the names of the children who will get less marbles than they now have. Draw an X on the names of the children who get more marbles than they have now.
5. Page C, middle. A group of children had some jelly beans. The most any child had was seven beans and the least any child had was one bean, as shown in the filled-in bars in the middle of the page. The children shared the beans fairly. How many would you predict each child had after sharing? Put X's in the squares in the empty bar to show the number of beans.
6. Page C, bottom. Arnold and Dorothy wanted to know which the thirty children in their class liked better, television or radio. Arnold asked twelve children and Dorothy asked three children. Most of the children Arnold asked like television and most of the children Dorothy asked like radio. If you think most children in the class like television better, draw an X in the box under the word television. If you think most children like radio better, draw an X in the box under the word radio.
7. Page D, top. John poured some water at room temperature into a pot. He placed a thermometer in the water. Thermometer A in the top row shows what the thermometer looked like. He placed the pot on a hot stove. A few minutes later, he looked at the thermometer in the water. One of the thermometers below Thermometer A shows what the thermometer probably looked like. Draw an X on it.
8. Page D, middle. John removed the pot from the heat and waited a few minutes. He then looked at the thermometer in the water again. Draw an X on the picture of the thermometer in the middle row which probably shows what the thermometer in the water looked like.

COPES Test Continued

9. Page E, middle. The pictures in the middle of the page deal with an experiment. A child heated water for five minutes and read the temperature after each minute, as shown in middle. One of the bar graphs below the worksheet shows what happened during the experiment. Draw an X on it.
10. Page E, bottom. Look at the bar graph at the bottom of the page. It represents the changing temperature of water in a glass. The water is either getting warmer or cooler. If you think the water is getting warmer, draw an X in the box under the letter w. If you think the water is getting cooler, draw an X in the box under the letter c.

Each question counted for one point.

5 pencils

4 pencils

3 pencils

2 pencils

2 pencils

1 pencil

Marrie

Jan

Phil

Leis

Barroll

2

5

4

5 years

6 years

7 years

8 years

5 years

4 years

3 years

2 years

1 year old

Arnold

Jaabe

Dean

Dorothy

Carol

Kathy

Phil

2

5 brothers

Dean

4 brothers

3

3 brothers

Jan

2 brothers

1

1 brother

Arnold

2

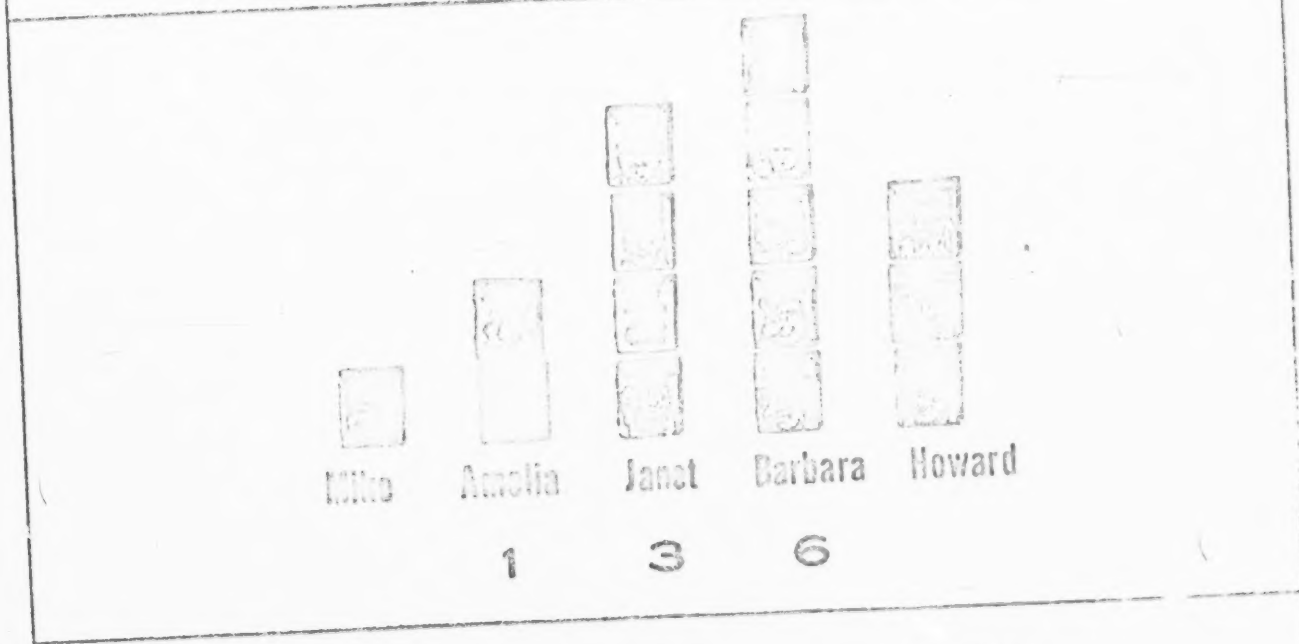
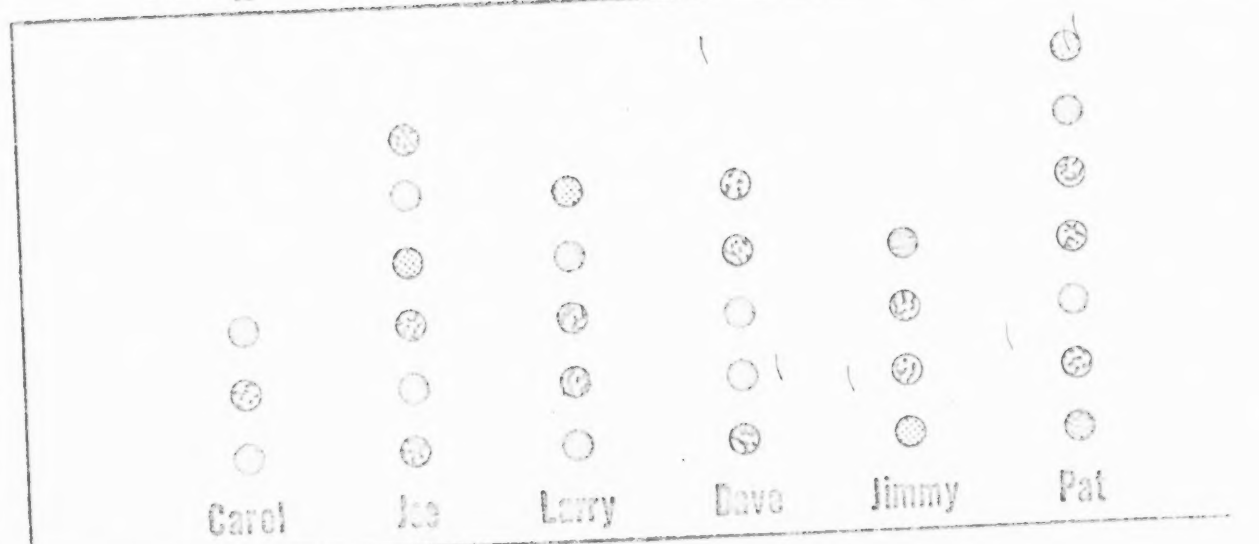
Phil

Dean

Jan

Arnold

PAGE B



Muriel	Mary	Arnold	Al	Sophie
4	6	5	4	6
	5	2	7	

Detrol

☐

Janice

☐

X	X	X	X	X	X	X		
---	---	---	---	---	---	---	--	--

X								
---	--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--	--

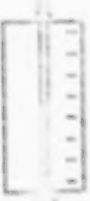
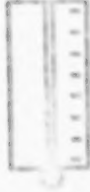
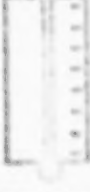
television

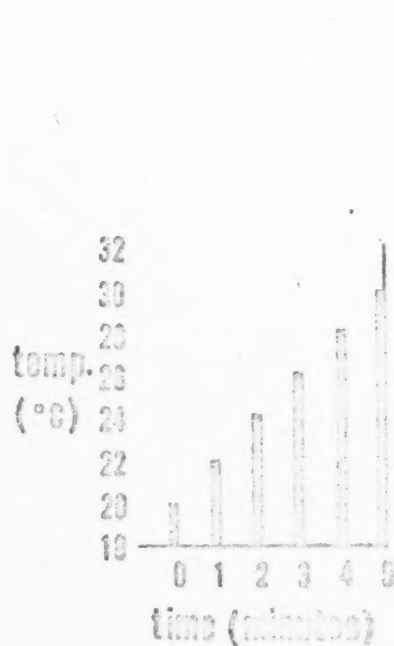
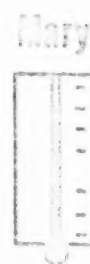
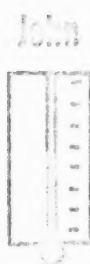
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radio

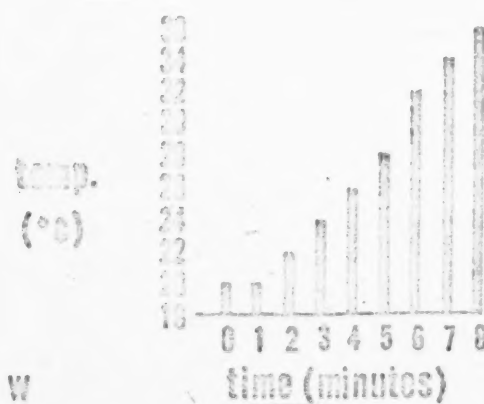
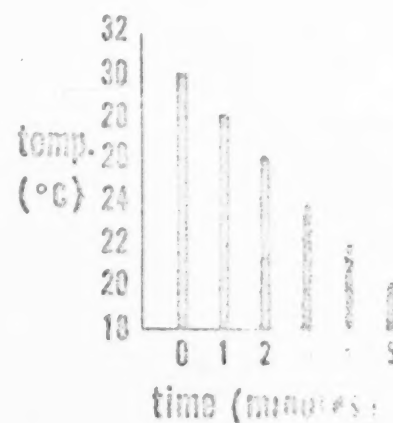
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John  Mary 													
John 	Mary 	John 	Mary 	John 	Mary 								



time (minutes)	temp. (°C)
0	20
1	22
2	24
3	26
4	28
5	30



W

☐

C

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APPENDIX II

TITLE I CORRECTIVE PROGRAMS IN THE NON-PUBLIC SCHOOLS
CORRECTIVE MATHEMATICS PROGRAM

ARITHMETIC INVENTORY - GRADES 2 - 6

School _____ Date _____

Name _____ Class _____

A. I like to wake up early in the morning.

1	2	3
never	sometimes	most of the time

B. I like to do arithmetic for fun.

1	2	3
never	sometimes	most of the time

1. I like doing arithmetic better than reading a story.

(0) 1	(3) 2	(5) 3
never	sometimes	most of the time

2. I think doing arithmetic is easy.

(2) 1	(2) 2	(5) 3
never	sometimes	most of the time

3. At home, I like to do my arithmetic homework first.

(6) 1	(3) 2	(5) 3
never	sometimes	most of the time

4. Looking at a lot of numbers scares me.

(5) 1	(3) 2	(0) 3
never	sometimes	most of the time

5. I think arithmetic is more like a game than like schoolwork.

(0) 1	(3) 2	(5) 3
never	sometimes	most of the time

6. I think about arithmetic when I have nothing else to do. $\begin{pmatrix} 6 \\ 3 \end{pmatrix}$
-
- never sometimes most of the time
-
7. I give up fast when I cannot answer an arithmetic problem. $\begin{pmatrix} 6 \\ 3 \end{pmatrix}$
-
- never sometimes most of the time
-
8. I like to do story problems. $\begin{pmatrix} 3 \\ 3 \end{pmatrix}$
-
- never sometimes most of the time
-
9. I think working with numbers is fun. $\begin{pmatrix} 5 \\ 3 \end{pmatrix}$
-
- never sometimes most of the time
-
10. I try very hard to understand arithmetic. $\begin{pmatrix} 5 \\ 3 \end{pmatrix}$
-
- never sometimes most of the time
-
11. I get mixed up when I do arithmetic problems. $\begin{pmatrix} 6 \\ 3 \end{pmatrix}$
-
- never sometimes most of the time
-
12. I do arithmetic puzzles just for fun. $\begin{pmatrix} 5 \\ 3 \end{pmatrix}$
-
- never sometimes most of the time
-
13. When I have to do arithmetic in school I feel bad. $\begin{pmatrix} 6 \\ 3 \end{pmatrix}$
-
- never sometimes most of the time
-
14. I like to count things. $\begin{pmatrix} 5 \\ 3 \end{pmatrix}$
-
- never sometimes most of the time
-
15. I read books that tell about numbers. $\begin{pmatrix} 5 \\ 3 \end{pmatrix}$
-
- never sometimes most of the time

16. I like to do arithmetic most of the time.

5	3	1
---	---	---

5	3	1
---	---	---

5	3	1
---	---	---

never

sometimes

most of the time

17. Doing arithmetic makes me nervous.

5	3	1
---	---	---

5	3	1
---	---	---

5	3	1
---	---	---

never

sometimes

most of the time

18. I think doing arithmetic is hard.

5	3	1
---	---	---

5	3	1
---	---	---

5	3	1
---	---	---

never

sometimes

most of the time

19. Doing arithmetic has made me feel better.

5	3	1
---	---	---

5	3	1
---	---	---

5	3	1
---	---	---

never

sometimes

most of the time

20. I like to use numbers when I'm not in school.

5	3	1
---	---	---

5	3	1
---	---	---

5	3	1
---	---	---

never

sometimes

most of the time

(This study is summarized above as Report No. 12.)

THE RELATIONSHIPS AMONG SCHOOL ATTITUDES,
SCHOOL ACHIEVEMENT, AND STUDENT-TEACHER
MATCHUPS ON PARTICULAR PERSONALITY TRAITS

Submitted to:
Model Educational Research
Training Program
School of Education
New York University

Very little research has been done in the area of pupil attitude toward school as a function of personality compatibility between teacher and pupil. Among the reasons for this is perhaps the conservative nature that characterizes American education, and the resulting reluctance to make judgments concerning a teacher's private personality as measured by standardized personality inventories. Whether this conservatism stems from a general distrust of such research or from the feeling that many personality characteristics demand the ultimate in privacy and are totally irrelevant to the educational process, one can only speculate. But recent research by Christopher Jencks (1972), the noted Harvard Sociologist, has lent supporting evidence to the theory that a factor of primary importance in evaluating schools is whether or not the teachers and students see the school situation as a satisfying one. And in the service of determining the saliences that produce such a satisfying view of the school situation, it is felt that personality studies in the educational setting are justified.

One approach that might be useful in improving the classroom atmosphere is to try to distribute students and teachers on the basis of interpersonal attraction (pupil-pupil and pupil-teacher). The attempt to explain interpersonal attractions is a relatively recent one and one which has produced conflicting data. One explanation put forth by Newcomb (1956) is a theory of propinquity. He says, "other things being equal, people are most likely to be attracted toward those in closest contact with them." However, in real life, although this rule

may have some validity, "other things" are rarely, if ever, equal, and a more profound understanding of the attraction phenomena should be reached.

One line of thought that is especially appealing because of its apparent correlation to common sense is that people with similar attitudes will tend to get along better with each other than people with dissimilar attitudes. In the present context the rationale for this can be seen as a variation of Festinger's Theory of Social Comparison (Griffitt, 1966) which deals with the evaluation of one's opinions and abilities through comparisons with others. The theory implies that people have a drive to evaluate opinions and abilities. When no objective criteria for evaluation can be found, people find that other, similar people are more precise comparisons than people who are dissimilar, and the similarity functions as a reward. Therefore, based on the amount of reinforcement provided, similar persons are more attracted to each other than dissimilar ones (Griffitt, 1966).

Taking off on this line of thought, Newcomb proposes that the "attraction between individuals is a function of the extent to which reciprocal rewards are present in the interaction." (Newcomb, 1956). Thus, if as Festinger implies, these rewards can be obtained from other people, it is not unreasonable to assume as Newcomb does that "the possession of similar characteristics predisposes individuals to be attracted to each other to the degree that those characteristics are both observable and valued by those who observe them - insofar as they provide a basis for similarity in attitudes"

(Newcomb, 1956). It is then possible to view the interpersonal attraction, as Byrne does, as a function of the number of rewards relative to the number of punishments obtained from an interpersonal association (Byrne and Nelson, 1965). When Byrne manipulated similarity experimentally, attraction was found to increase as the similarity of an experimental stranger increased (Byrne and Nelson, 1965). In fact, he found that the relationship between the proportion of similar attitudes and attraction is a linear one. In supporting studies, Griffitt (1966) found that regardless of a person's ideal-self concept, he tends to be attracted to people whose real-self concepts are similar to his own. Izard (1960), using Edwards' Personal Preference Schedule (PPS), found that mutual friends have similar personality profiles and have significant positive correlations on some of the separate personality characteristics that make up the profile.

But can there be an empirical law of attraction that considers attraction as a positive function of similarity? Common sense would seem to answer this question with a resounding NO! It would be difficult, for example, to expect to find a positive attraction between two individuals with very domineering natures. Winch et al. (1955) addressing themselves to this problem proposed the concept of "complementariness". They postulated two types of complementariness, type I utilizing opposing attractive characteristics that fall on the same continuum. For example, "a person high in need dominance would be attracted to a person in that need" (Winch, et al., 1955). Type II complementariness involves attraction based on charac-

3

teristics found on different continuums. For example, Winch et al (1955) hypothesized that "a person high in need abasement would be attracted to another who was high in need hostility." (Winch et al, 1955). Newscomb (1956) points out that Winch's "complementariness" can also be seen as a form of similarity in that both parties agree on who will be the dominant and who will not. In a more recent study Hendrick and Brown (1971) found that extraverts preferred extraverts over intraverts as ideal personalities, preferred leaders, reliable friends, and as being ethical and honest. On the other hand, although intraverts preferred intraverts as reliable friends and as being honest and ethical, they preferred the dissimilar extraverts as leaders and as ideal personalities. Hendrick and Page (1970) found similar mixed results. Positive relationships were found between perceived similarity and positive attraction when considering intelligence, sophistication, sincerity, happiness, and a social distance scale. However, negative relationships were obtained for two undesirable traits, arrogance and cynicism. The contradictory nature of much of the past research is further evidenced by Izard's study which tended to rule out complementariness (Izard, 1960). He found that the social desirability of the characteristics was not related to the degree in which friends are alike on the characteristics.

It seems then, that in predicting interpersonal attractions, a certain amount of "common sense" is needed in deciding between the doctrines of similarity and complementariness, for both have been supported in research studies.

Since the present study has taken place in the schools it is necessary to relate the material to the educational setting. This transition is made by Rothman (1956) who stated that there is an overall relationship between teacher personality and certain areas of learning. His study indicates that the "teacher effect" can not be attributed to any one factor, but involves rather the interaction of several different teacher characteristics. He calls for a scheme to match teachers and students in terms of some relevant characteristics of each so as to minimize the effectiveness of the student- teacher interaction of the learning process. Wright (1966) said that a liked teacher would be more influenced and effective in producing attitude changes in students than a disliked teacher. Moreover, Thelen (1970) found that what is called "teachability" results from the quality of the relationship between child and teacher.

The present study will make use of both the theories (similarity and complementariness) by combining them in a realistic way in this particular situation. In doing so, special reference is made to Hendrick and Brown's study which predicted that extraverts would prefer extraverts over intraverts as leaders(teachers), and intraverts would feel no major preference.

Summary

General question: What is the relationship between personality and attitude?

Specific question: How does personality affect attitude?

Specific question:

PROBLEMS

General problems:

1. What is the relationship between positive school attitudes and teacher-student "matchups" on particular personality traits?
2. What is the relationship between school attitudes and school achievement?
3. What is the relationship between school achievement and teacher-student "matchups" on particular personality traits?

Specific problems:

1. Will the attitudes of students toward the school environment become more negative as the teachers' I-E score becomes more introversive with respect to the student? (An I-E score is an introversion-extraversion score.)
2. Will the student's achievement become poorer as the teachers' I-E score becomes more introversive with respect to the student?
3. Will a student's achievement improve as his attitude, toward the school environment becomes more positive?
4. Will a student's attitude toward the school environment vary positively with his achievement?

DEFINITION OF TERMS

1. Extrovert (extravertive)- Subjects who are so labeled are considered as those whose attentions and interests are primarily outside of the self - in other words, outgoing. Five scales from Cattell's 16 PF test are combined to determine a subject's degree of extraversion. According to Cattell (1970), these five scales are affectothymia (A+), parrnia (H+), surgency (F+), group dependence (Q2-), and dominance (E+). For simplicity in combining the various factors, sten scores have been used. Thus, a combined sten score of 27.5 or more is considered extravertive.

2. Intravert (intraversive)- Subjects who are so labeled will be considered as those whose attentions and interests are primarily inside the self - in other words, the opposite of outgoing. The same five scales used to determine extroversion have been used here except that introverted subjects are those whose combined score is less than 27.5.
3. Positive feeling about the school environment- Since an adaptation of a scale by Weaver (1960) which has not been normed was used in this study, attitudes will be spoken of in relative terms; that is, groups or individuals with lower scores on the attitude scales were considered to have a more positive attitude toward the school environment. The scale samples the students' attitudes concerning school in general, studying, classrooms, teachers, and rules, and scores them on a scale from 1 to 7, with higher numbers indicating poorer attitudes.
4. I-E difference (intraversion- extraversion difference)- Each student's extraversion score was subtracted from that of his classroom biology teacher to provide a measure of relative teacher- student difference in extraversion. For example, if the teacher had a very low score (intraversive) and the student's score was high (extraversive), the I-E difference would be a relatively high negative number.
5. Achievement- Each student's four marking period grades were averaged with his regents grade (if there was one) and his biology average for the year was computed.

HYPOTHESES

General hypotheses:

1. There is a positive relationship between school attitudes and favorable teacher-student "matchups" on particular personality traits.
2. There is a positive relationship between school attitudes and school achievement.
3. There is a positive relationship between school achievement and favorable teacher-student "matchups" on particular personality traits.

Specific hypotheses:

1. As a teacher's I-E score becomes more intraversive with respect to that of the student, the student's attitude toward the school environment will become more negative.
2. As the teacher's I-E score becomes more intraversive with respect to that of the student, the student's achievement will become poorer.
3. As a student's attitude toward the school environment becomes more positive, his achievement will be greater.
4. As a student's achievement becomes higher, his attitude toward the school environment will become more positive.

RESEARCH DESIGN AND METHODOLOGY

Sample- The sample included 385 biology students from John Adams High School in Ozone Park, Queens, New York, and their

respective teachers. This particular school was chosen because of its availability as a cooperating agent. The original sample tested was over 700 students but for only 388 of them was all the necessary information available. In all, the sample included 11 teachers (all of biology), nine of which were male and two of which were female. The teachers are all caucasian, as is most of the student sample. The area is middle class.

Instruments-

1. 16 Personality Factor Questionnaire (16 PF)- This test is a set of 16 questionnaire scales arranged in omnibus form. Although it is designed to provide information on 23 separate personality factors, this research only made use of five of the primary factors sampled. These were:

- a) affectothymia (A+)
- b) parmia (H+)
- c) surgency (F+)
- d) group dependence (Q₂-)
- e) dominance (E+)

These factors are combined, according to the 16 PF Handbook, in order to arrive at a measure of exvia or invia (extraversion or intraversion). Further information concerning the reliability, validity, and norming populations can be obtained from the 16 PF Handbook (Cattell, 1970).

2. High School Questionnaire (HSQ)- This test, also by Cattell, is analagous to the 16 PF except that it is intended for high school aged children. It was adapted in the same way as the 16 PF.

3. The attitude scale- The scale used in this research is an

adaptation of a scale developed by Weaver in 1960. The original scale with 36 items proved to have a split half reliability of .92 and a standard error of measurement of .06 of one scale interval. The adaptation used in this study uses only 30 of the items, the remaining six not having been deemed relevant. The purpose of the scale is to give a measure of individual student's attitudes about the school environment.

Procedure- In late March, 1973 each biology student in the sample was given Cattell's HSQ personality inventory and at the same time each of the involved teachers was given a 16 PF personality inventory. From this data each student and teacher could be labeled as extraverted or introverted and I-E differences were determined for each student by subtracting his I-E score from that of his teacher. The HSQ's were administered by the classroom teachers, each of whom was briefly trained in test administration. The 16 PF questionnaires were administered by the researcher.

Early in May the students were given the attitude scale by their previously trained classroom teachers in order to determine the student's attitude toward the school environment.

At the completion of the school year grading sheets for each biology class were obtained and each student's year's performance was averaged with his regents score (biology), if it was available, to determine his level of achievement.

Due to the ex post facto nature of the project, the three variables most used (I-E difference, student attitude toward the school environment, and achievement) were set up in

two ways. In the first instance, attitude was designated as the dependent variable and a multiple regression program (BMD02R) was used since the variables were continuous to determine the proportion of the variance in attitude accounted for by the two independent variables, I-E difference and achievement. In the second instance (subproblem 2), achievement was considered the dependent variable with I-E difference and attitude now being the independent variables. The same regression program was used here to determine the proportions of variances accounted for. Student sex designations were also run with the program for descriptive research purposes. In addition, due to the author's original interest in astrology, the sample was divided into the 12 astrological signs according to their birthdays and a BMD02R program was run separately on each of the 12 subsamples. Also the means derived from each astrological grouping was subjected to a one way analysis of variance to determine the significance of any differences in that area.

Students		Teachers		I- introvert E- extrovert
		I	E	
Subproblem #1	Hi Ach			Hi Ach- high achievement
	Low Ach			Low Ach- Low achievement
	Hi Ach			+ Att- positive attitude
	Low Ach			- Att- negative attitude
Students		Teachers		
		I	E	
Subproblem #2	+ Att			
	- Att			
	+ Att			
	- Att			

RESULTS

The study was divided into two subproblems by simply manipulating which variable would be designated dependent. In the first subproblem in which attitude toward the school environment was the dependent variable, neither of the two hypotheses (one and two) was substantiated. That is, no significant relationship was found between teacher-student I-E difference and school attitudes; nor was a significant relationship obtained between achievement and attitude (R equaled .117 while the critical value at the .05 level is .141). On the other hand, it was determined that the sex of the student was useful in predicting attitude toward the school environment: girls' attitudes were significantly more positive than boys' at the .05 level ($F=5.775$).

The second subproblem showed more promising, though not spectacular results. Although neither of the hypotheses concerned with subproblem two (three and four) were confirmed, it was found that extraverted people with better school attitudes achieved better in biology. Interestingly, attitude by itself was not found to be a valid predictor, but the combination of attitude and extraversion with an F value of 6.4795 exceeded the critical value at the .01 level (4.66) and was thus a significant predictor at this level. Astrological signs were not found useful as predictors of I-E score, attitude, or achievement.

CONCLUSIONS AND IMPLICATIONS FOR FURTHER RESEARCH

In conclusion it could be said that extraverts who are girls and thus have better attitudes toward the school environment are most likely to achieve well in school. Since none of the hypotheses was confirmed, it is likely that sloppiness of design is at least partially responsible. It is suggested that an attitude scale be used which is more nearly validated for such work and that a simple extraversion-intraversion scale such as Eysenck's be used. In the meantime the positive results obtained could be somewhat useful as a start in the diagnosis of some children who have difficulty achieving.

SUMMARY TABLE FOR SUBPROBLEM 2

	<u>R</u>	<u>Variance accounted for</u>	<u>F</u>
Attitude	.1125	.0127	
Intra- extra	.1703	.0290	6.4795

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